AERMEC
air conditioning

INSTALLATION MANUAL

CHILLER
REVERSIBLE HEAT PUMP

NRL 028-075

- EXTERNAL UNIT
- HIGH EFFICENCY
- HOT WATER PRODUCING UP TO 131°F / 55°C
- POWER SUPPLY 60Hz

EN

AERMEC COMPANY QUALITY SYSTEM ICIM ISO 9001:2008 - Cert. n° 0128 CISQ IQNet AERMEC S.P.A.

C ETL LISTED CM US Intertek

AHRI CERTIFIED® www.ahridirectory.org Air-Cooled Chillers AHRI Standard 550/590

11_14. 5641200_01

Dear Customer, Thank you for choosing an AERMEC product. This product is the result of many years of experience and in-depth engineering research, and it is built using top quality materials and advanced technologies. In addition, the CE mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability. Product data may be subject to modifications deemed necessary for improving the product without the obligation to give prior notice.

Thank you again.
AERMEC S.p.A

AERMEC S.p.A. reserves the right at all times to make any modification for the improvement of its product and is not obliged to add these modification to machines of previous manufacture that have already been delivered or are being built.

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Standards and Directives respected on designing and constructing the unit:

PROTECTION RATING
1. IP 24

ACOUSTIC PART:
1. ISO DIS 9614/2 (INTENSIMETRIC METHOD))
2. SOUND POWER (EN ISO 9614-2)
3. SOUND PRESSURE (EN ISO 3744)

REFRIGERANT GAS:
This unit contains fluoride gases with greenhouse effect covered by the Kyoto Protocol. Maintenance and disposal must only be performed by qualified staff.

STANDARD:
UL 1995
Heating and cooling equipment.

ANSI/NFPA
Standard 70 National Electrical code (N.E.C.).

CSA C.22.1.- C.22.2
Safety Standard Electrical Installation.

1. DESCRIPTION AND CHOCE OF UNIT

Chillers and heat pumps for outdoor condensed in the air with R410A Series NRL have been designed and manufactured to satisfy heating and cooling needs and the production of domestic hot water (DHW) in medium to small commercial or residential buildings.

Maximum reliability
The presence of several scroll compressors allows NRL chillers various partialisations of the cooling capacity.

Models:
1. **NRL "°" standard chiller**
2. **NRL "H" heat pump ***
3. **NRL "C" motocondensing**

*** Possibility of production of D.H.W. (DCPX_UL | VMF-ACS | AER^{485}).**

The versions can be in different set-ups at the same time in order to satisfy a wide range of plant engineering solutions:

1. **"A" HIGH EFFICIENCY**
2. **"E" SILENCED HIGH EFFICIENCY**
3. **"D" WITH DESUPERHEATER**
4. **"T" WITH TOTAL RECOVERY**

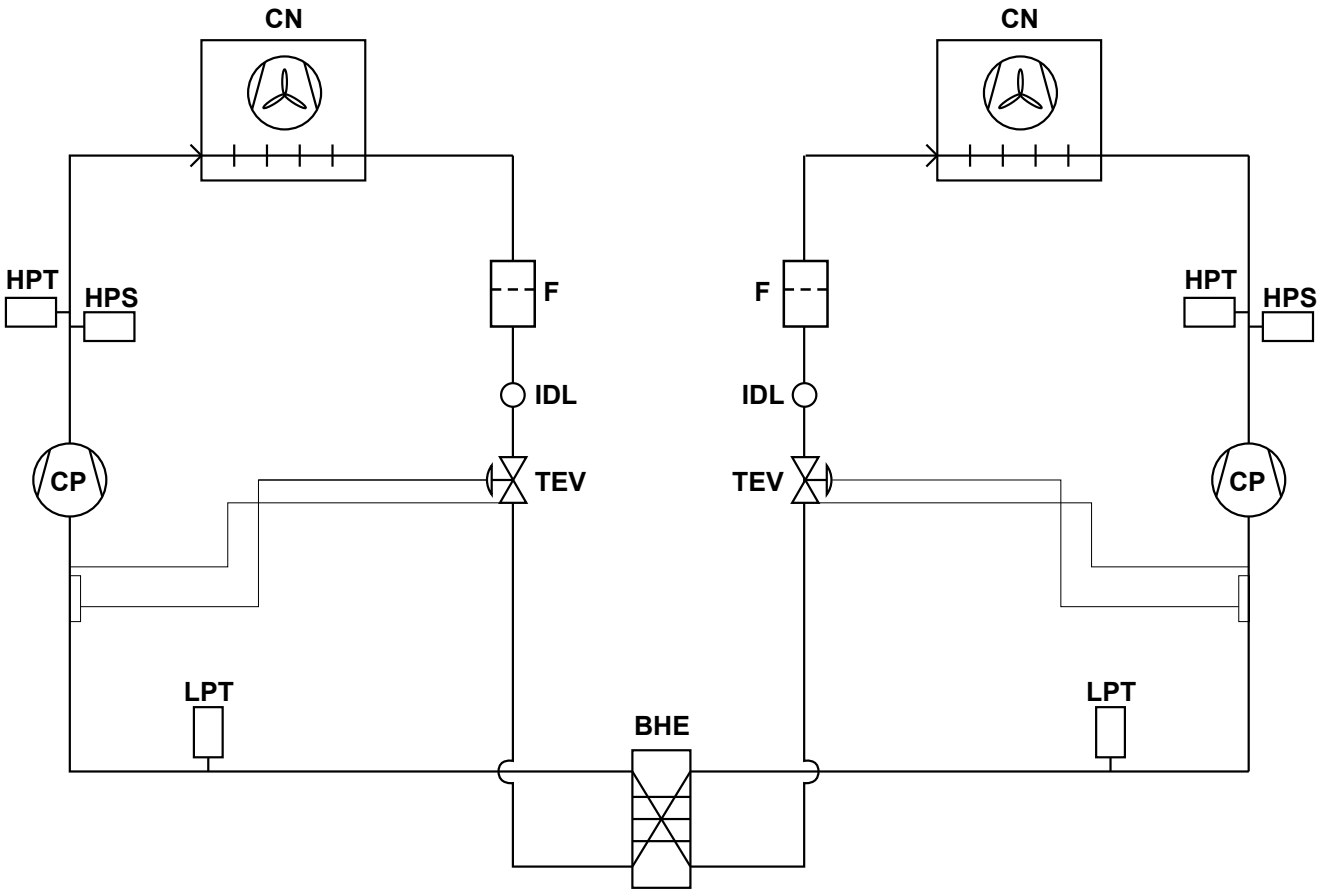
Configurations not allowed:
YD / YT / YH
HT / HC
TC / DC

2. CHECK LIST

COMPONENTS	VERSIONS				
COOLING CIRCUIT	**°**	**H**	**C**	**D**	**T**
THERMOSTATIC VALVE X - Y (CONFIGURATION OPTION)	yes	yes	no	no	no
EXCHANGER PLATE (EVAPORATOR)	yes	yes	no	yes	yes
EXCHANGER PLATE (TOTAL RECOVERY)	no	no	no	no	yes
EXCHANGER PLATE (DESUPERHEATER)	no	no	no	yes	no
AIR SIDE EXCHANGE	yes	yes	yes	yes	yes
COMPRESSOR	yes	yes	yes	yes	yes
DEHYDRATOR FILTER	yes	yes	yes	yes	yes
HIGH PRESSURE SWITCH	yes	yes	yes	yes	yes
LOW PRESSURE SWITCH	no	no	no	no	no
HIGH PRESSURE TRANSDUCER	yes	yes	yes	yes	yes
LOW PRESSURE TRANSDUCER	yes	yes	yes	yes	yes
LIQUID INDICATOR	yes	yes	yes	yes	yes
LIQUID TANK	no	yes	no	no	yes
ONE-WAY VALVES	no	yes	no	no	yes
LIQUID SEPARATOR	no	yes	no	no	yes
CYCLE REVERSE VALVE	no	yes	no	no	yes

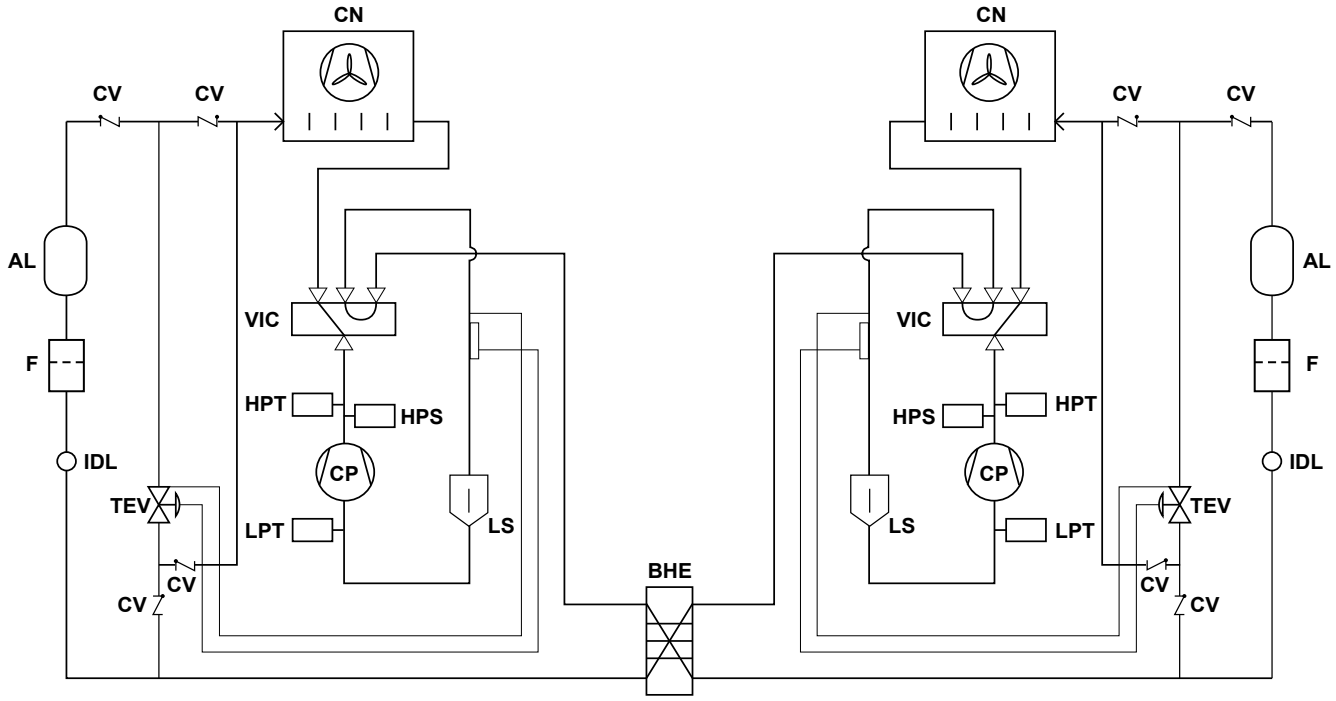
3. COOLING CIRCUIT

3.1. NRL COOLING CIRCUIT ONLY COOLING



KEY	
BHE	EXCHANGER PLATE
CN	AIR SIDE EXCHANGE
CP	COMPRESSOR
F	DEHYDRATOR FILTER
HPS	HIGH PRESSURE SWITCH
HPT	HIGH PRESSURE TRANSDUCER
IDL	LIQUID INDICATOR
LPT	LOW PRESSURE TRANSDUCER

3.2. NRL COOLING CIRCUIT HEAT PUMP



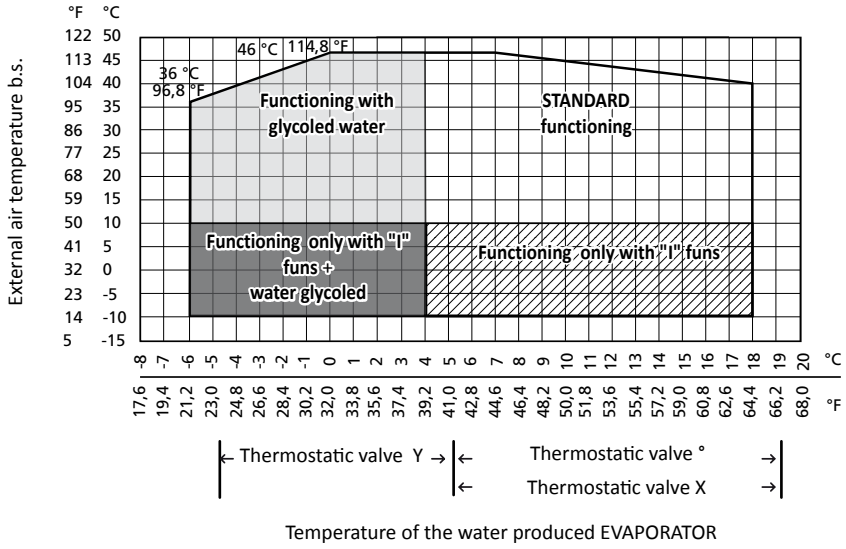
KEY	
AL	LIQUID TANK
BHE	EXCHANGER PLATE
CN	AIR SIDE EXCHANGE
CP	COMPRESSOR
CV	ONE-WAY VALVES
F	DEHYDRATOR FILTER
HPS	HIGH PRESSURE SWITCH
HPT	HIGH PRESSURE TRANSDUCER
IDL	LIQUID INDICATOR
LPT	LOW PRESSURE TRANSDUCER
LS	LIQUID SEPARATOR
VIC	CYCLE INVERSION VALVE

4. OPERATION LIMIT

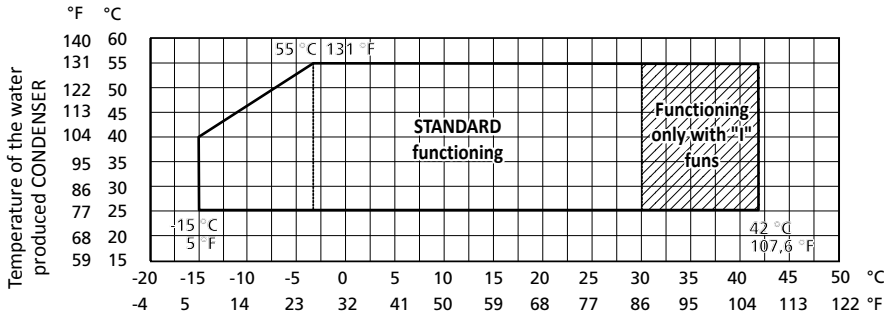
4.1. COOLING MODE [1]

The units, in standard configuration, are not suitable for installation in salty environments. For functioning limits, please refer to the diagrams below, valid for AHRI standard conditions.

Wind breaks should be implemented if the unit is installed in particularly windy areas, to prevent a malfunction of the unit.


External air temperature b.s.
46 °C 114,8 °F
36 °C 96,8 °F
Functioning with glycoled water
STANDARD functioning
Functioning only with "I" funs + water glycoled
Functioning only with "I" funs
Thermostatic valve Y
Thermostatic valve °
Thermostatic valve X
Temperature of the water produced EVAPORATOR

4.2. HEATING MODE [1]


Temperature of the water produced CONDENSER
55 °C 131 °F
STANDARD functioning
Functioning only with "I" funs
-15 °C 5 °F
42 °C 107,6 °F
External air temperature b.s.

REFRIGERANT SIDE		High pressure side	Low pressure side
Acceptable maximum pressure	bar/PSI	45/653	30/435
Acceptable maximum temperature	°C / °F	120 / 257	51 / 131
Acceptable minimum temperature	°C / °F	-30 /- 22	-30 / -22

WATER SIDE		
Acceptable maximum pressure	bar/PSI	6/87

Hydarulic circuit safety valve
(only in version with storage tank or with pump)
Calibrated at 6/87 bar/PSI and with piped discharge, which intervents by discharging overpressure if abnormal work pressure occur.

ATTENTION
Contact our technical sales department if the unit needs to operated outside the operating limits.

ATTENTION
If the unit is installed in particularly windy areas, we recommend providing for windbreak to avoid malfunctioning

Note:
1 - In summer mode the unit can be started with external air 46°C/114,8°F and water inlet 35°C/95°F. In winter mode the unit can be started with external air -15°C/5°F and water inlet 20°C/68°F. Operate in such conditions is permitted only for a short time and to bring the system up to temperature. To reduce the time of this operation, it is recommended to install a three-way valve that allows bypassing water from the system utilities, until the conditions that allow the unit to work within the permitted operation limits are achieved.

5. SELECTION AND PLACE OF INSTALLATION

Prima di procedere all'installazione dell'unità concordare con il cliente la posizione dove andrà collocata, ponendo attenzione ai punti seguenti:

- The support surface must be capable of supporting the unit weight.
- The safety differences between the unit and other appliances or structures must be scrupulously respected so that the inlet and outlet air from the fans is free to circulate.
- The unit must be installed by an enabled technician in compliance with the national legislation in force in the country of destination, respecting the minimum technical spaces in order to allow maintenance.

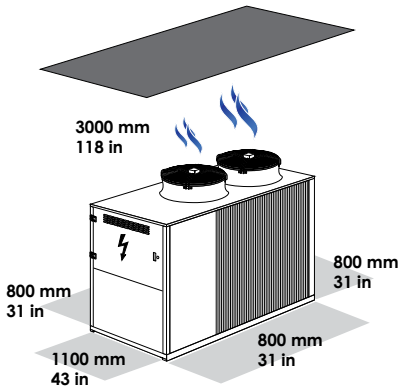
6. POSITIONING

The machine is delivered from the factory wrapped in estincoil. Before handling the unit, verify the lifting capacity of the machines used. After removal of packaging, movement of apparatus must be carried out by qualified and adequately equipped personnel.

The unit must be installed by a qualified and suitably trained technician, in compliance with the national legislation in force in the country of destination (Ministerial Decree 329/2004).
AERMEC will not assume any responsibility for damage due to failure to follow these instructions.

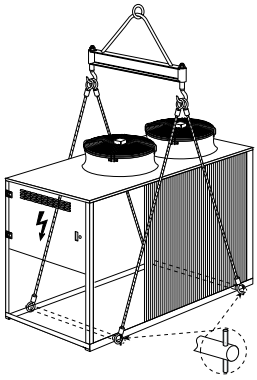
Before beginning any operation, READ THESE INSTRUCTIONS CAREFULLY AND CARRY OUT THE SAFETY CHECKS TO REDUCE ALL RISK OF DANGER TO A MINIMUM. All the staff involved must have thorough knowledge of the operations and any dangers that may arise at the moment in which the installation operations are carried out.

5.1. MINIMUM TECHNICAL



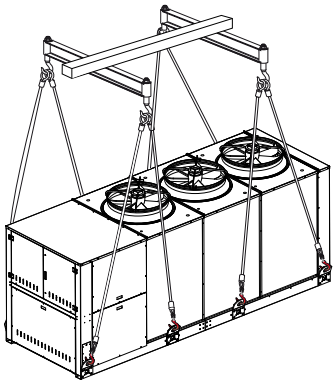
ATTENTION:
The drawings are only examples.

EXAMPLE 1
"OF THE LIFTING"
Size 0280-0700.
Insert pipes (NOT SUPPLIED) in holes on the base with length such to allow positioning of the belts used for lifting.
To prevent the unit structure being damaged by the belts place protections between the latter and the machine.
It is prohibited to stop under the unit.



NOTE:
The appliance warranty does not cover the costs for ladders, scaffolding, or other elevation systems that may become necessary for carrying out servicing under warranty.

EXAMPLE 2
"OF THE LIFTING"
NRL 0750 (always use all the provided eyebolts)
Before moving the unit, check the lifting capacity of the machines used.
Once the packaging has been removed, the unit must be handled by qualified personnel, using the appropriate equipment.
To handle the machine:
"IN THE EVENT OF LIFTING", hook the lifting cables to the special eyebolts In order to avoid damaging the unit with the cables, insert protection elements between them and the machine. Is it absolutely forbidden to stand beneath the unit.

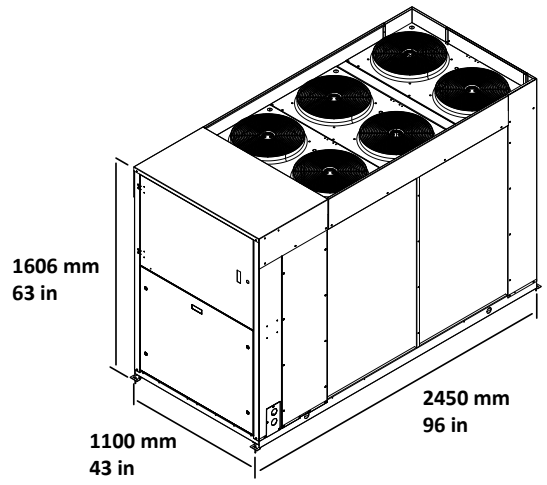


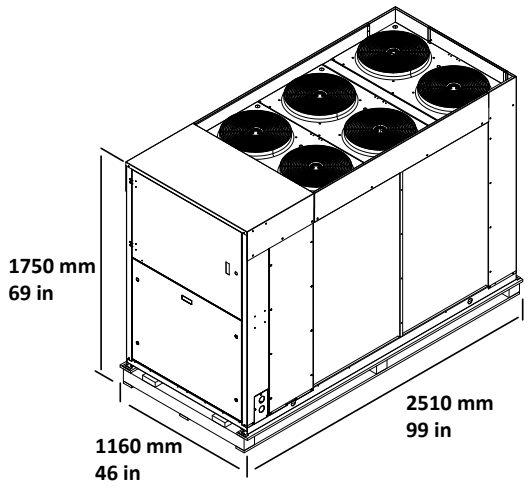
ATTENTION
L'unità viene fornita fissata su di un pallet, per la movimentazione con carri elevatori e cinghie prevedere dei pali (NON FORNITI).

ATTENTION
Always use all the provided eyebolts.

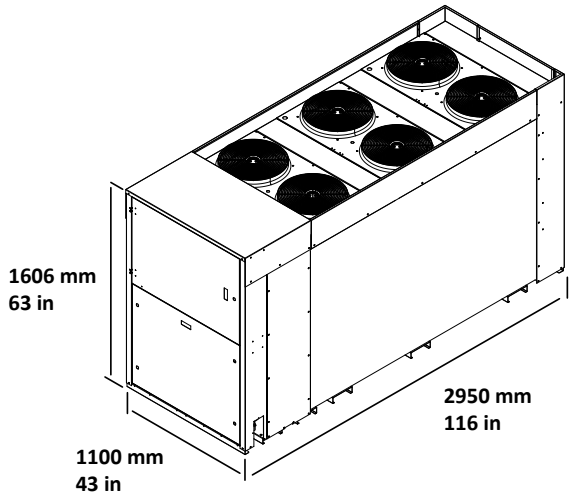
7. DIMENSION

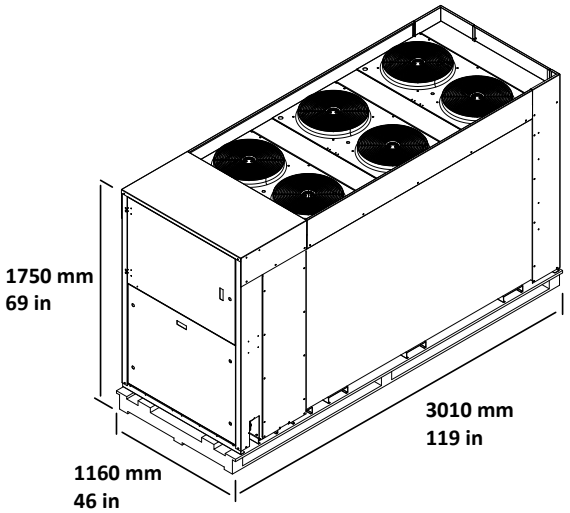
7.1. NRL 0280 E / NRL 0280 HE



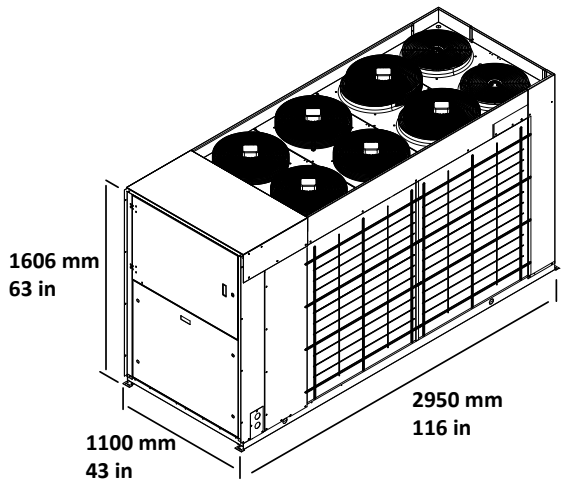


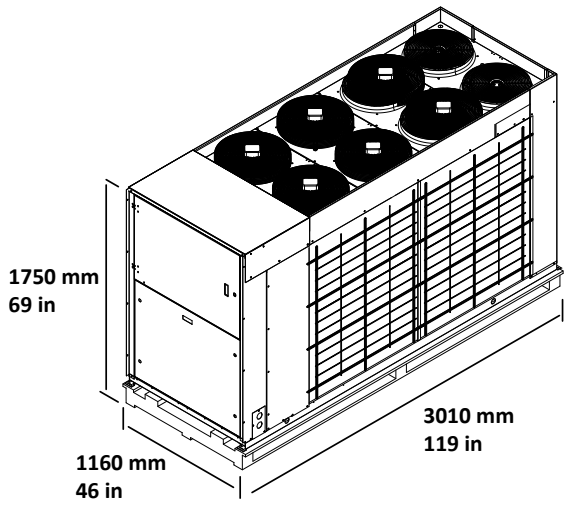
7.2. NRL 0300 E



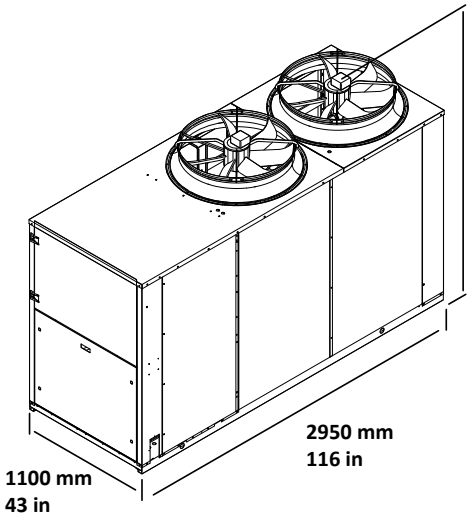


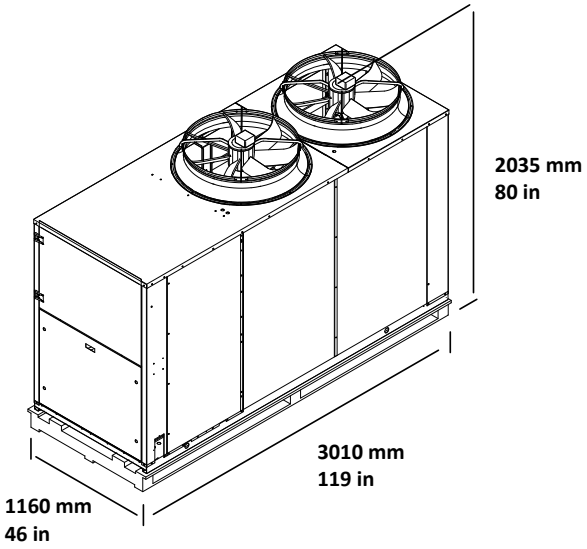
7.3. NRL 0330 - 0350 E / NRL 0300 - 0330 - 0350 HE



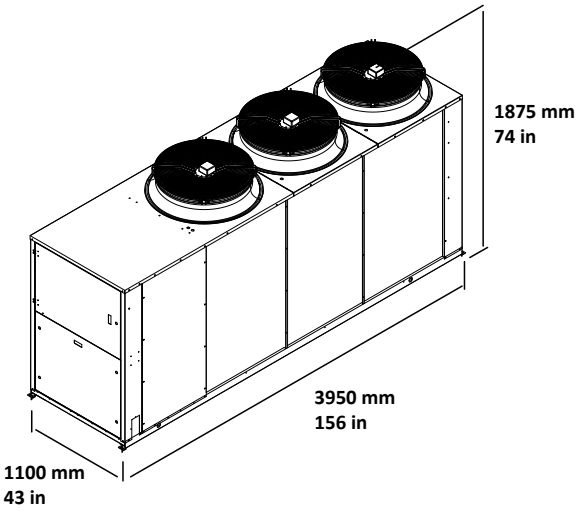


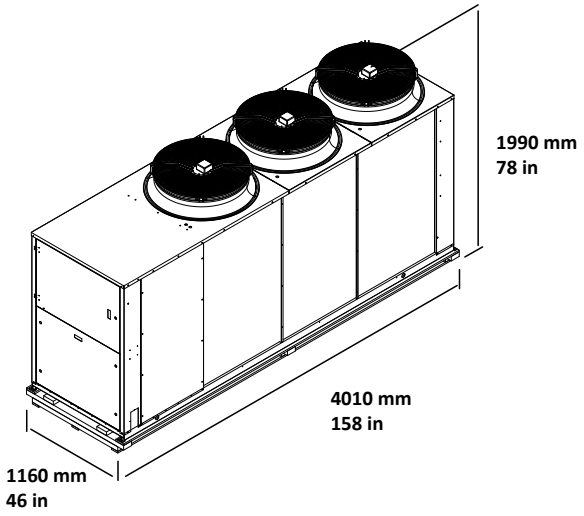
7.4. NRL 0500 - 0550 A / NRL 0500 - 0550 HA



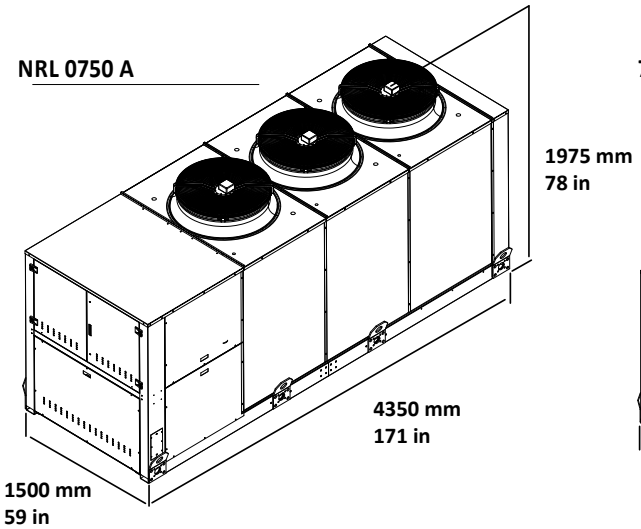


7.5. NRL 0600 - 0650 - 0700 A / 0600 - 0650 - 0700 HA

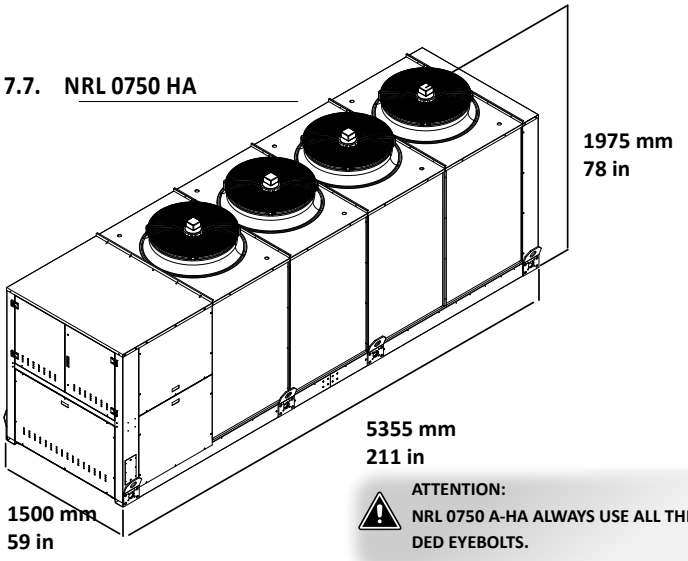




7.6. NRL 0750 A



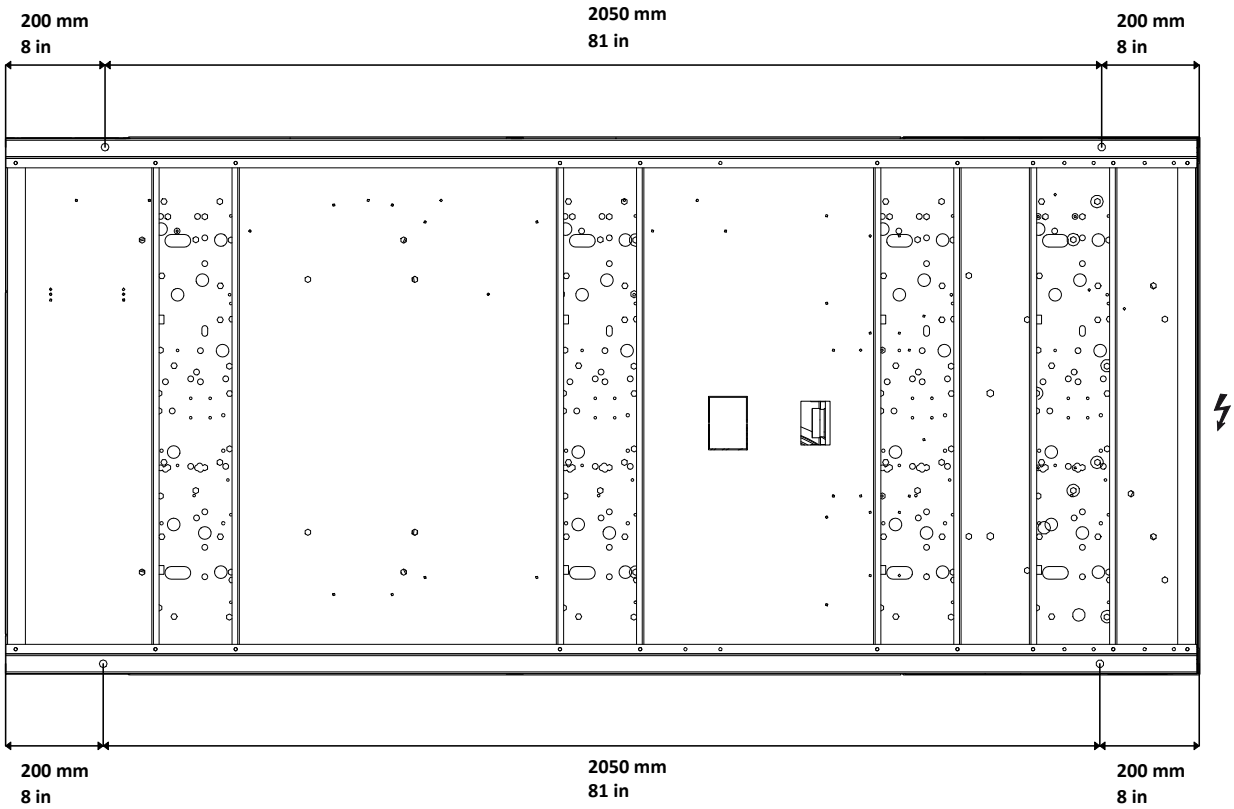
7.7. NRL 0750 HA



ATTENTION:
NRL 0750 A-HA ALWAYS USE ALL THE PROVIDED EYEBOLTS.

8. ANTIVIBRATION POSITIONING

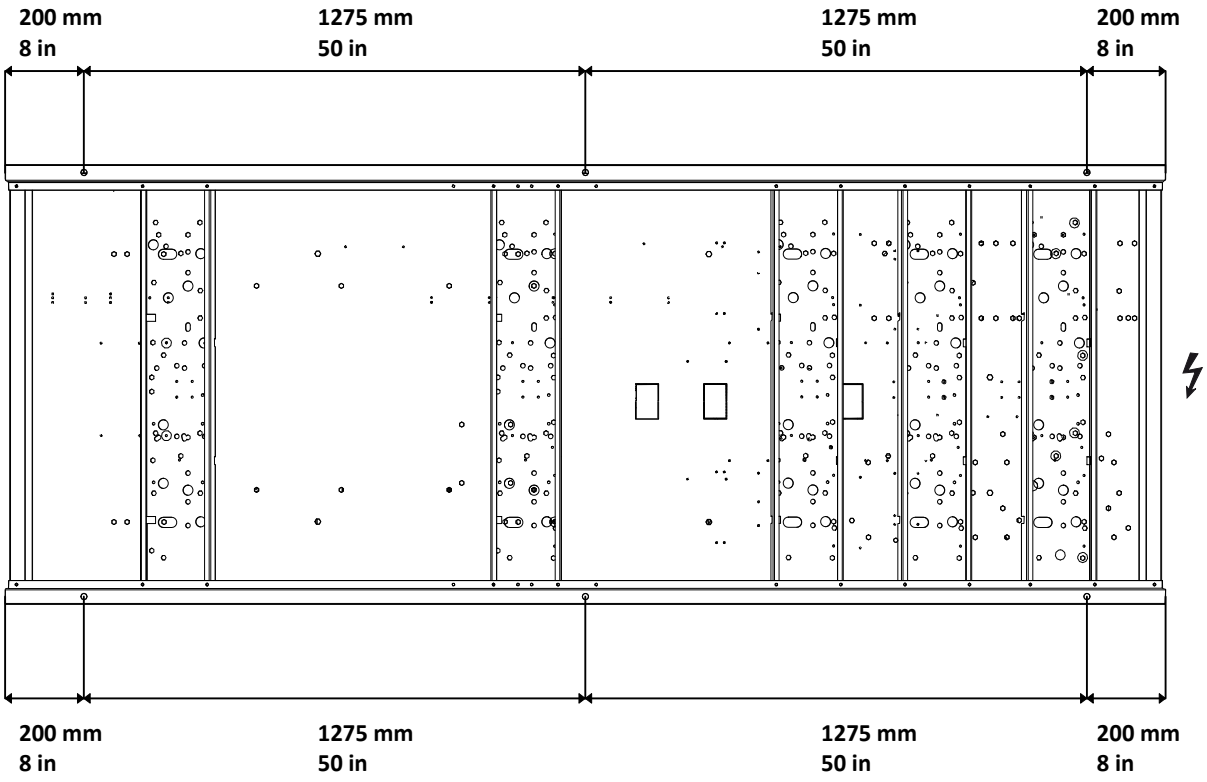
8.1. NRL 0280 E / NRL 0280 HE



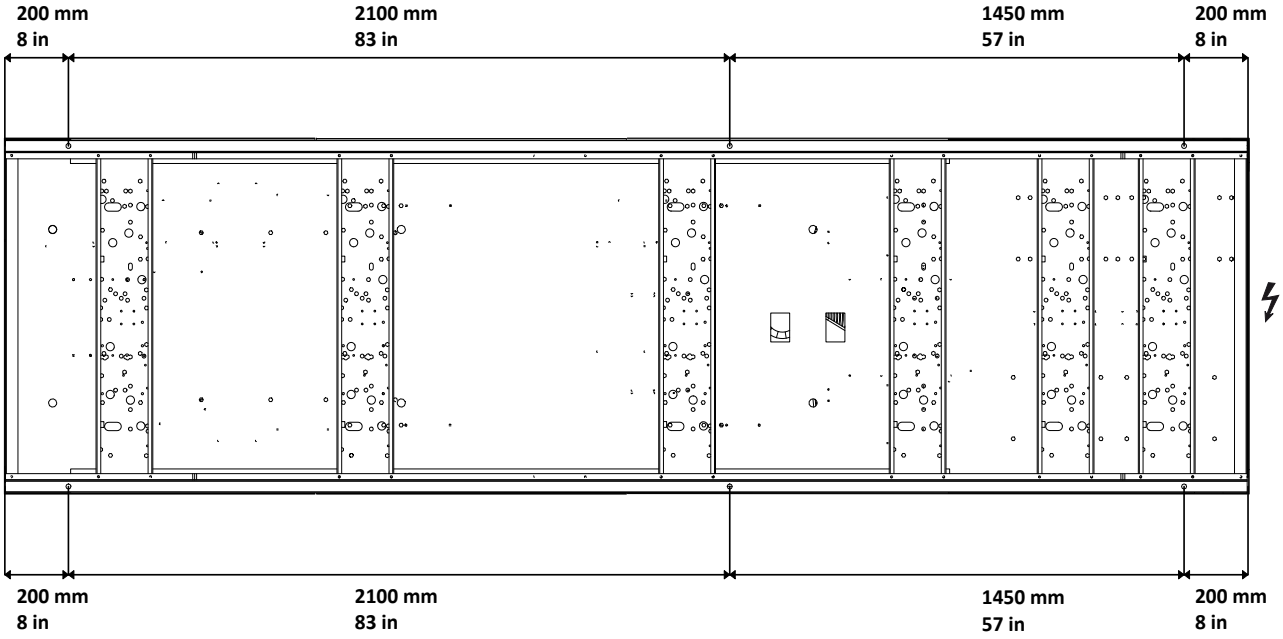
8.2. NRL 0300 E

8.3. NRL 0330 - 0350 E / NRL 0300 - 0330 - 0350 HE

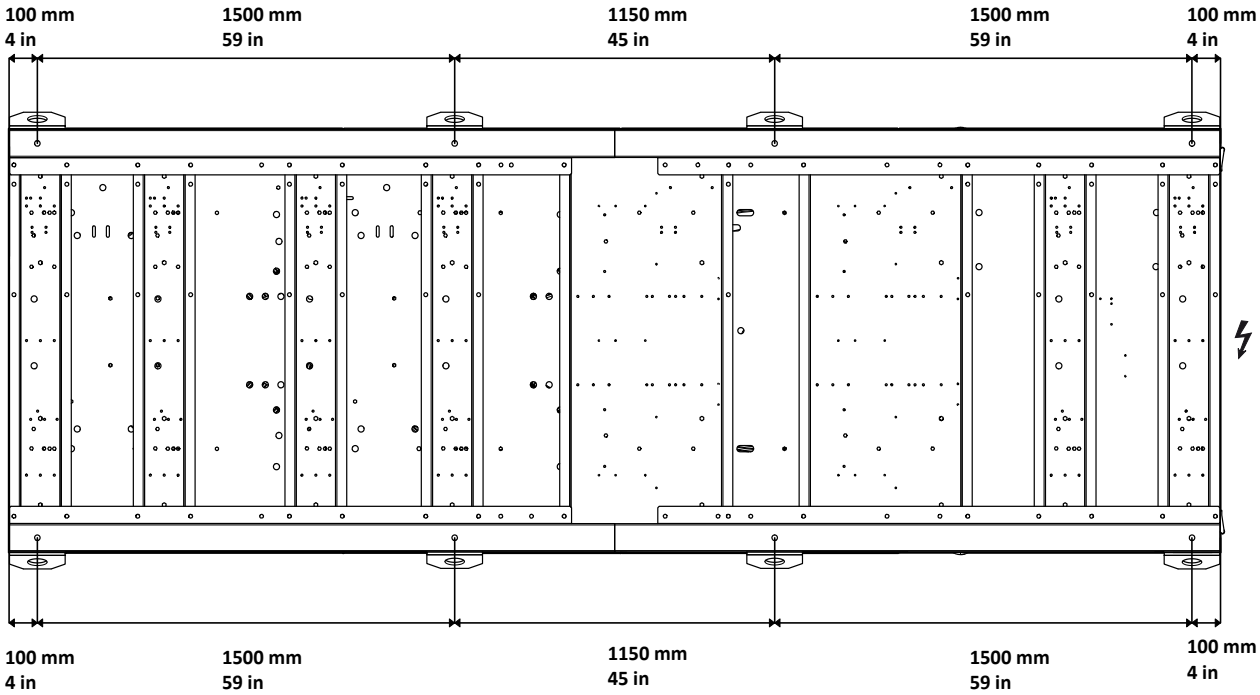
8.4. NRL 0500 - 0550 A / NRL 0500 - 0550 HA



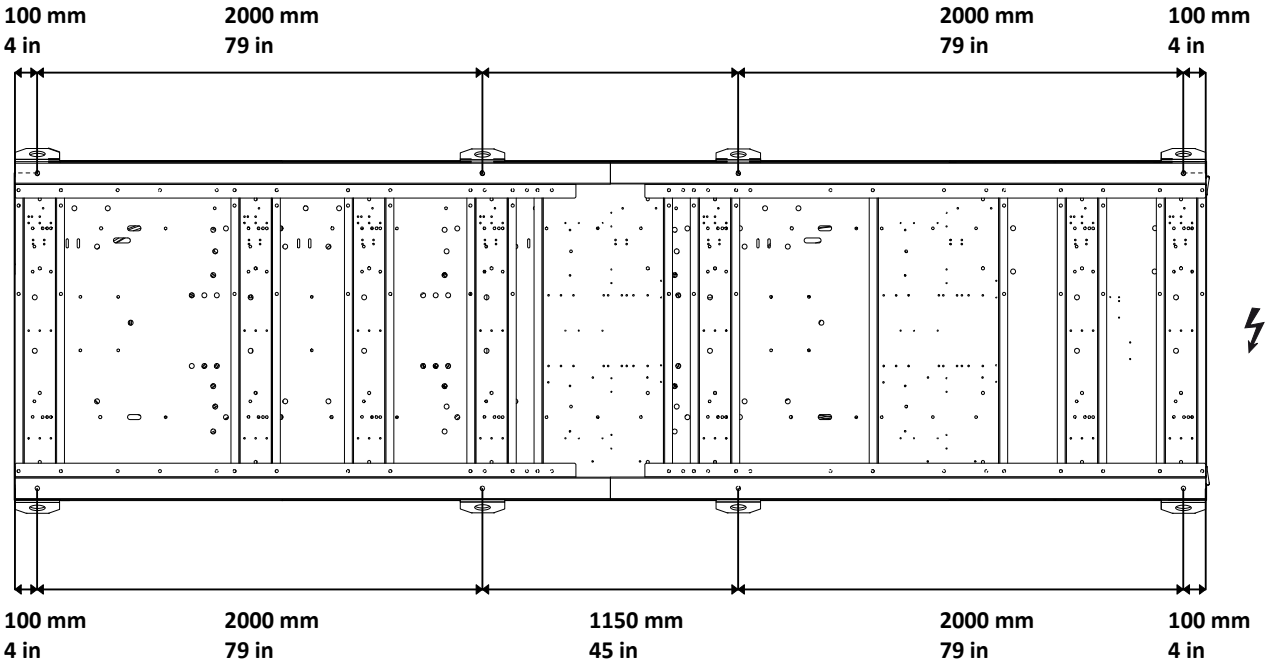
8.5. NRL 0600 - 0650 - 0700 A / 0600 - 0650 - 0700 HA



8.6. NRL 0750 A

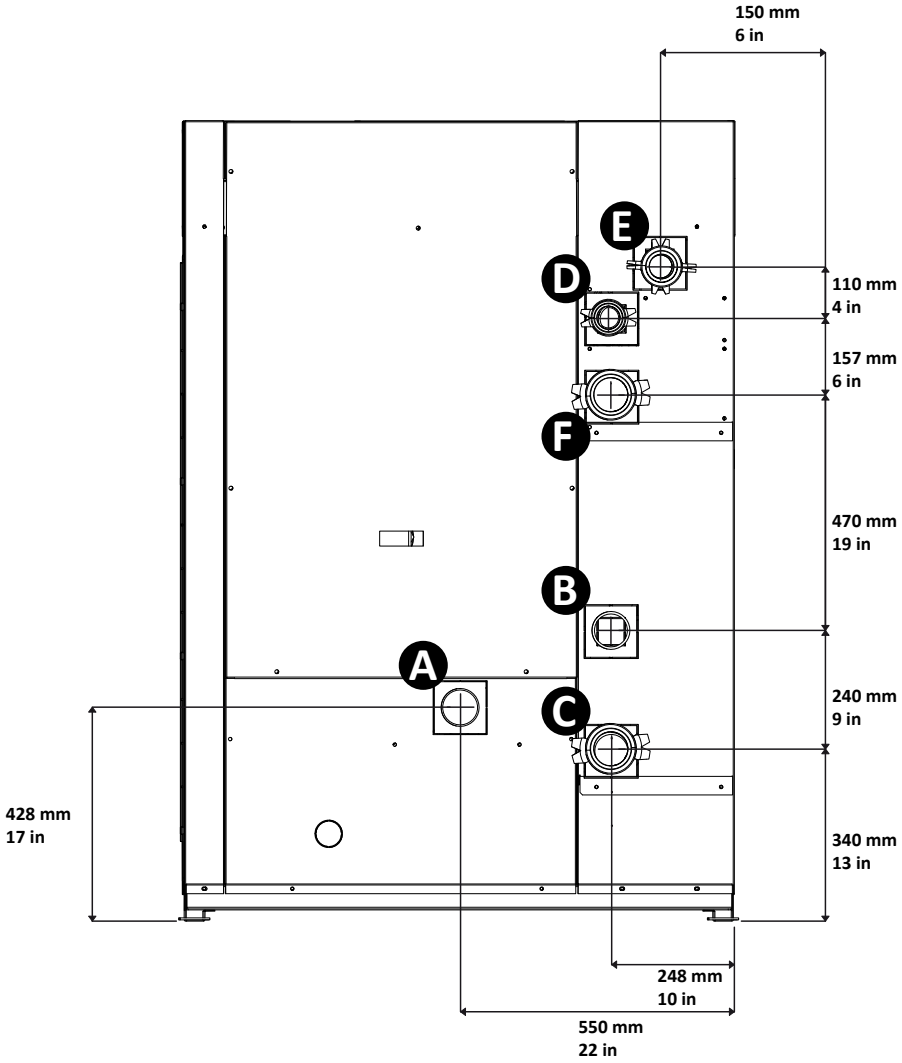


8.7. NRL 0750 HA



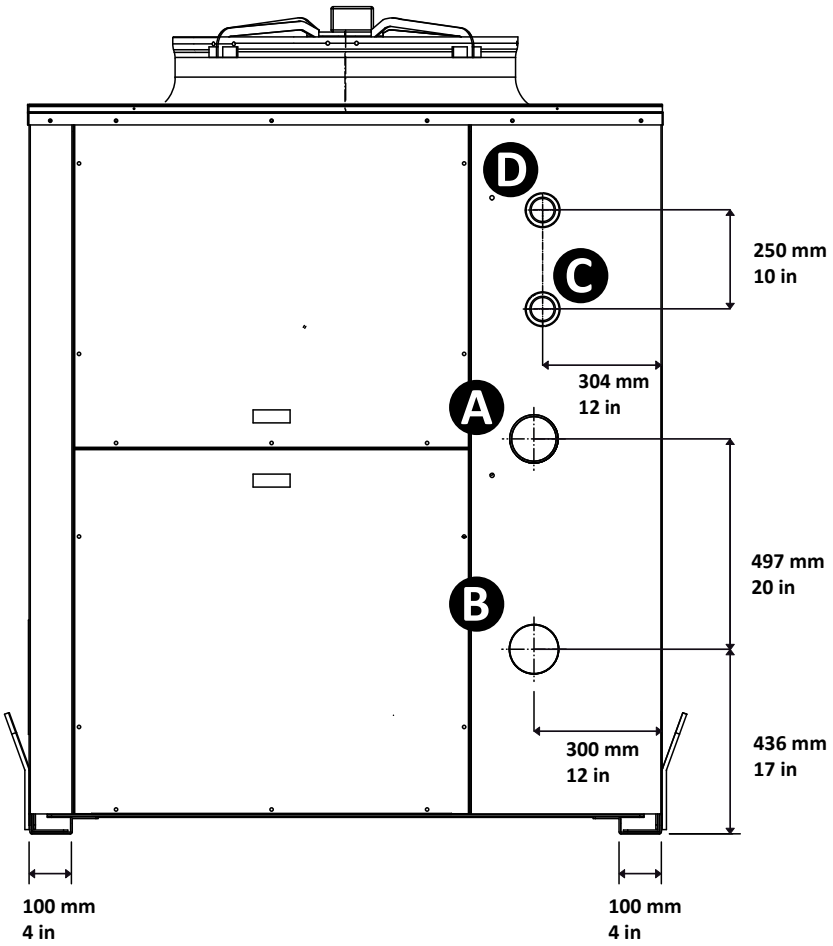
9. HYDRAULIC CONNECTION

9.1. HYDRAULIC CONNECTION NRL 0280-0700



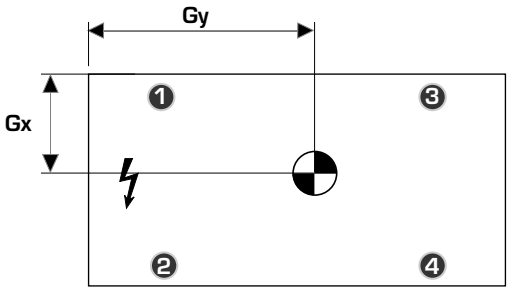
KEY		CONNECTIONS
A	IN - version with pump	Ø 2½"
B	IN - standard version [00]	Ø 2½"
C	OUT - standard versions and storage tank	Ø 2½"
D	IN - desuperheater	Ø 1½"
	IN - total recovery	Ø 2½"
E	OUT - desuperheater	Ø 1½"
	OUT - total recovery	Ø 2½"
F	IN - versions with storage tank	Ø 2½"

9.2. HYDRAULIC CONNECTION NRL 0750



KEY		CONNECTIONS
A	IN - standard version [00] and pump	Ø3"
	IN - version with storage tank	Ø4"
B	OUT - standard version [00] and pump	Ø3"
	OUT - version with storage tank	Ø4"
C	IN - desuperheater	Ø1½"
D	OUT - desuperheater	Ø1½"

10. DISTRIBUTION OF PERCENTAGE WEIGHTS ON SUPPORTINGPOINTS



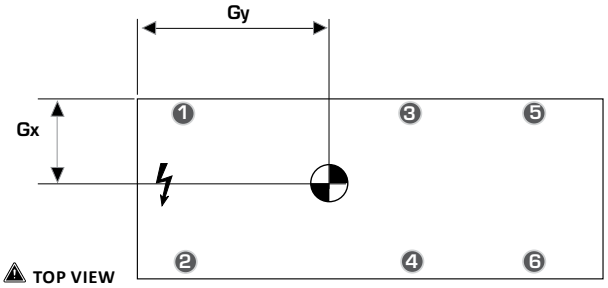
⚠ TOP VIEW

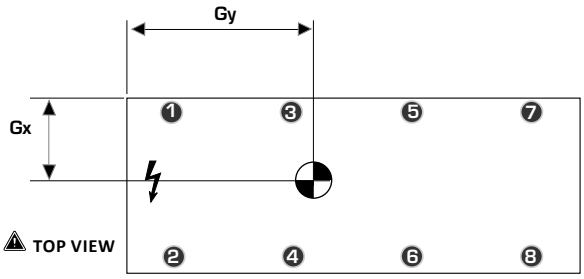
WEIGHT OF EMPTY UNITS											
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)				KIT VT
			Gxmm	Gxin	Gymm	Gyin	1	2	3	4	
NRL0280E	00	1401	558	21,97	965	37,99	25%	28%	22%	25%	VT 17
NRL0280E	02-04	1809	557	21,93	1146	45,12	21%	23%	27%	29%	VT 13
NRL0280E	01-03	1732	557	21,93	1102	43,39	22%	24%	26%	28%	VT 13
NRL0280E	P2-P4	1555	558	21,97	1082	42,60	22%	25%	25%	28%	VT 17
NRL0280E	P1-P3	1478	558	21,97	1026	40,39	24%	26%	24%	26%	VT 17
NRL0300E	00	1547	558	21,97	995	39,17	24%	27%	23%	26%	VT 17
NRL0300E	02-04	1955	556	21,89	1157	45,55	21%	23%	27%	30%	VT 13
NRL0300E	01-03	1878	557	21,93	1116	43,94	22%	24%	26%	29%	VT 13
NRL0300E	P2-P4	1701	557	21,93	1099	43,27	22%	24%	25%	28%	VT 17
NRL0300E	P1-P3	1624	558	21,97	1050	41,34	23%	26%	24%	27%	VT 17
NRL0330E	00	1568	558	21,97	1155	45,47	26%	29%	21%	24%	VT 17
NRL0330E	02-04	1976	556	21,89	1282	50,47	24%	26%	24%	26%	VT 13
NRL0330E	01-03	1899	557	21,93	1246	49,06	24%	27%	23%	26%	VT 13
NRL0330E	P2-P4	1722	557	21,93	1243	48,94	24%	27%	23%	26%	VT 17
NRL0330E	P1-P3	1645	558	21,97	1201	47,28	25%	28%	22%	25%	VT 17
NRL0350E	00	1711	558	21,97	1192	46,93	25%	28%	22%	25%	VT 17
NRL0350E	02-04	2119	556	21,89	1303	51,30	23%	26%	24%	27%	VT 13
NRL0350E	01-03	2042	557	21,93	1271	50,04	24%	26%	24%	26%	VT 13
NRL0350E	P2-P4	1866	557	21,93	1271	50,04	24%	26%	24%	26%	VT 17
NRL0350E	P1-P3	1789	558	21,97	1233	48,54	24%	27%	23%	25%	VT 17
NRL0500A	00	1869	568	22,36	1197	47,13	29%	31%	20%	21%	VT 13
NRL0500A	02-04	2328	564	22,20	1410	55,51	25%	27%	23%	25%	VT 10
NRL0500A	01-03	2242	565	22,24	1355	53,35	26%	28%	22%	24%	VT 10
NRL0500A	P2-P4	2041	566	22,28	1335	52,56	27%	28%	22%	23%	VT 13
NRL0500A	P1-P3	1955	567	22,32	1269	49,96	28%	29%	21%	22%	VT 13
NRL0550A	00	2075	569	22,40	1254	49,37	28%	30%	21%	22%	VT 13
NRL0550A	02-04	2534	565	22,24	1439	56,65	25%	26%	24%	25%	VT 10
NRL0550A	01-03	2448	566	22,28	1390	54,72	26%	27%	23%	24%	VT 10
NRL0550A	P2-P4	2247	567	22,32	1375	54,13	26%	28%	23%	24%	VT 13
NRL0550A	P1-P3	2161	568	22,36	1317	51,85	27%	29%	22%	23%	VT 13

WEIGHT OF RUNNING UNITS											
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)				KIT VT
			Gxmm	Gxin	Gy	Gyin	1	2	3	4	
NRL0280E	00	1432	550	21,65	974	38,35	25%	27%	23%	25%	VT 17
NRL0280E	02-04	2501	550	21,65	1253	49,33	19%	20%	29%	32%	VT 13
NRL0280E	01-03	2424	550	21,65	1225	48,23	19%	21%	29%	31%	VT 13
NRL0280E	P2-P4	1587	550	21,65	1088	42,83	23%	24%	26%	28%	VT 17
NRL0280E	P1-P3	1509	550	21,65	1034	40,71	24%	26%	24%	26%	VT 17
NRL0300E	00	1587	548	21,57	1005	39,57	25%	26%	24%	25%	VT 17
NRL0300E	02-04	2656	549	21,61	1256	49,45	19%	20%	30%	32%	VT 13
NRL0300E	01-03	2579	549	21,61	1229	48,39	19%	21%	29%	31%	VT 13
NRL0300E	P2-P4	1741	548	21,57	1106	43,54	22%	24%	26%	28%	VT 17
NRL0300E	P1-P3	1664	548	21,57	1058	41,65	23%	25%	25%	27%	VT 17
NRL0330E	00	1611	549	21,61	1164	45,83	26%	28%	22%	24%	VT 17
NRL0330E	02-04	2680	549	21,61	1349	53,11	23%	24%	25%	27%	VT 13
NRL0330E	01-03	2603	549	21,61	1325	52,17	23%	25%	25%	27%	VT 13
NRL0330E	P2-P4	1765	549	21,61	1250	49,21	25%	26%	24%	25%	VT 17
NRL0330E	P1-P3	1688	549	21,61	1209	47,60	25%	27%	23%	25%	VT 17
NRL0350E	00	1754	549	21,61	1200	47,24	26%	27%	23%	24%	VT 17
NRL0350E	02-04	2824	550	21,65	1362	53,62	22%	24%	26%	28%	VT 13
NRL0350E	01-03	2746	550	21,65	1340	52,76	23%	25%	25%	27%	VT 13
NRL0350E	P2-P4	1909	549	21,61	1276	50,24	24%	26%	24%	26%	VT 17
NRL0350E	P1-P3	1832	549	21,61	1240	48,82	25%	27%	23%	25%	VT 17
NRL0500A	00	1916	560	22,05	1209	47,60	29%	30%	20%	21%	VT 13
NRL0500A	02-04	3477	555	21,85	1583	62,32	23%	23%	27%	27%	VT 10
NRL0500A	01-03	3391	555	21,85	1551	61,06	23%	24%	26%	27%	VT 10
NRL0500A	P2-P4	2088	559	22,01	1342	52,83	27%	28%	22%	23%	VT 13
NRL0500A	P1-P3	2002	559	22,01	1278	50,31	28%	29%	21%	22%	VT 13
NRL0550A	00	2128	561	22,09	1263	49,72	28%	29%	21%	22%	VT 13
NRL0550A	02-04	3689	556	21,89	1593	62,72	23%	23%	27%	27%	VT 10
NRL0550A	01-03	3603	557	21,93	1563	61,54	23%	24%	26%	27%	VT 10
NRL0550A	P2-P4	2300	560	22,05	1380	54,33	26%	27%	23%	24%	VT 13
NRL0550A	P1-P3	2214	561	22,09	1324	52,13	27%	28%	22%	23%	VT 13

WEIGHT OF EMPTY UNITS														
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)						KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	
NRL0600A	00	2425	553	21,77	1706	67,17	5,6%	5,6%	33,2%	33,6%	11,0%	11,1%	VT 22
NRL0600A	02-04	2932	553	21,77	1821	71,69	3,7%	3,7%	34,8%	35,1%	11,3%	11,4%	VT 22
NRL0600A	01-03	2822	553	21,77	1801	70,91	4,0%	4,1%	34,5%	34,8%	11,3%	11,4%	VT 22
NRL0600A	P2-P4	2668	553	21,77	1766	69,53	4,6%	4,7%	34,0%	34,3%	11,2%	11,3%	VT 22
NRL0600A	P1-P3	2557	553	21,77	1740	68,50	5,0%	5,1%	33,6%	34,0%	11,1%	11,2%	VT 22
NRL0650A	00	2447	551	21,69	1695	66,73	5,7%	5,8%	33,3%	33,3%	10,9%	11,0%	VT 22
NRL0650A	02-04	2954	550	21,65	1811	71,30	3,8%	3,8%	34,8%	34,9%	11,3%	11,3%	VT 22
NRL0650A	01-03	2844	550	21,65	1791	70,51	4,2%	4,2%	34,5%	34,6%	11,2%	11,3%	VT 22
NRL0650A	P2-P4	2690	550	21,65	1755	69,09	4,8%	4,8%	34,0%	34,1%	11,1%	11,1%	VT 22
NRL0650A	P1-P3	2579	550	21,65	1729	68,07	5,2%	5,2%	33,7%	33,8%	11,0%	11,1%	VT 22
NRL0700A	00	2447	557	21,93	1679	66,10	5,9%	6,0%	32,8%	33,6%	10,7%	11,0%	VT 22
NRL0700A	02-04	2954	555	21,85	1798	70,79	4,0%	4,1%	34,4%	35,1%	11,1%	11,4%	VT 22
NRL0700A	01-03	2844	556	21,89	1777	69,96	4,4%	4,4%	34,1%	34,8%	11,1%	11,3%	VT 22
NRL0700A	P2-P4	2690	556	21,89	1741	68,54	4,9%	5,1%	33,6%	34,3%	10,9%	11,2%	VT 22
NRL0700A	P1-P3	2579	556	21,89	1714	67,48	5,4%	5,5%	33,2%	34,0%	10,8%	11,1%	VT 22

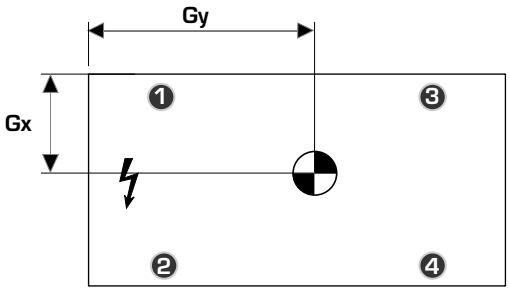
WEIGHT OF RUNNING UNITS													
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)						KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	
NRL0600A	00	2491	547	21,54	1715	67,52	5,5%	5,4%	33,7%	33,3%	11,1%	11,0%	VT 22
NRL0600A	02-04	4079	548	21,57	1979	77,91	0,6%	0,6%	37,5%	37,3%	12,0%	11,9%	VT 22
NRL0600A	01-03	3968	548	21,57	1969	77,52	0,8%	0,8%	37,4%	37,1%	12,0%	11,9%	VT 22
NRL0600A	P2-P4	2712	547	21,54	1773	69,80	4,6%	4,5%	34,4%	34,1%	11,3%	11,2%	VT 22
NRL0600A	P1-P3	2601	547	21,54	1748	68,82	5,0%	4,9%	34,1%	33,7%	11,2%	11,1%	VT 22
NRL0650A	00	2513	545	21,46	1704	67,09	5,7%	5,6%	33,7%	33,1%	11,1%	10,9%	VT 22
NRL0650A	02-04	4101	547	21,54	1971	77,60	0,8%	0,7%	37,6%	37,1%	12,0%	11,8%	VT 22
NRL0650A	01-03	4012	547	21,54	1960	77,17	1,0%	1,0%	37,4%	36,9%	11,9%	11,8%	VT 22
NRL0650A	P2-P4	2756	545	21,46	1762	69,37	4,7%	4,6%	34,5%	33,9%	11,3%	11,0%	VT 22
NRL0650A	P1-P3	2646	545	21,46	1737	68,39	5,1%	5,0%	34,2%	33,5%	11,2%	11,0%	VT 22
NRL0700A	00	2535	547	21,54	1693	66,65	5,8%	5,7%	33,5%	33,1%	11,0%	10,8%	VT 22
NRL0700A	02-04	4123	548	21,57	1963	77,28	0,9%	0,9%	37,4%	37,1%	11,9%	11,8%	VT 22
NRL0700A	01-03	4034	548	21,57	1952	76,85	1,1%	1,1%	37,2%	37,0%	11,9%	11,8%	VT 22
NRL0700A	P2-P4	2778	547	21,54	1752	68,98	4,9%	4,8%	34,2%	33,9%	11,1%	11,0%	VT 22
NRL0700A	P1-P3	2668	547	21,54	1727	67,99	5,3%	5,2%	33,9%	33,6%	11,1%	11,0%	VT 22





WEIGHT OF EMPTY UNITS															
NRL	TYPE	WEIGHT (lib) WEIGHT	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	7	8	
NRL0750A	00	3571	755	29,72	1840	72,44	8,4%	8,5%	18,2%	18,5%	20,8%	21,0%	2,3%	2,3%	VT 23
NRL0750A	02-04	4167	754	29,69	1919	75,55	7,4%	7,5%	18,0%	18,2%	22,5%	22,8%	1,8%	1,8%	VT 23
NRL0750A	01-03	4034	754	29,69	1904	74,96	7,6%	7,7%	18,1%	18,3%	22,2%	22,4%	1,9%	1,9%	VT 23
NRL0750A	P2-P4	3858	754	29,69	1881	74,06	7,9%	8,0%	18,1%	18,3%	21,7%	21,9%	2,0%	2,1%	VT 23
NRL0750A	P1-P3	3726	754	29,69	1863	73,35	8,1%	8,2%	18,2%	18,4%	21,3%	21,5%	2,1%	2,2%	VT 23

WEIGHT OF RUNNING UNITS															
NRL	TYPE	WEIGHT (lib) WEIGHT	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								KIT VT
			Gx	Gx in	Gy	Gy in	1	2	3	4	5	6	7	8	
NRL0750A	00	3660	746	29,37	1847	72,72	8,5%	8,4%	18,4%	18,2%	21,1%	20,9%	2,3%	2,3%	VT 23
NRL0750A	02-04	5798	747	29,41	2048	80,63	5,5%	5,5%	17,8%	17,7%	26,0%	25,8%	0,9%	0,9%	VT 23
NRL0750A	01-03	5666	747	29,41	2040	80,31	5,7%	5,6%	17,8%	17,7%	25,7%	25,6%	0,9%	0,9%	VT 23
NRL0750A	P2-P4	3946	746	29,37	1886	74,25	7,9%	7,8%	18,3%	18,1%	22,0%	21,7%	2,0%	2,0%	VT 23
NRL0750A	P1-P3	3814	746	29,37	1869	73,58	8,2%	8,1%	18,4%	18,2%	21,6%	21,3%	2,2%	2,1%	VT 23



⚠ **TOP VIEW**

WEIGHT OF EMPTY UNITS

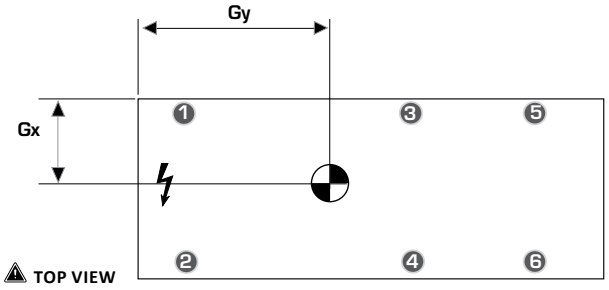
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)				KIT VT
			Gxmm	Gxin	Gymm	Gyin	1	2	3	4	
NRL0280HE	**00**	1589	557	21,95	984	38,73	25%	27%	23%	25%	VT 17
NRL0280HE	**02-04**	1997	556	21,89	1144	45,04	21%	23%	27%	29%	VT 13
NRL0280HE	**01-03**	1920	556	21,90	1104	43,46	22%	24%	26%	28%	VT 13
NRL0280HE	**P2-P4**	1744	557	21,92	1087	42,78	22%	25%	25%	28%	VT 17
NRL0280HE	**P1-P3**	1667	557	21,93	1038	40,85	23%	26%	24%	27%	VT 17
NRL0300HE	**00**	1765	557	21,93	1188	46,78	25%	28%	22%	24%	VT 17
NRL0300HE	**02-04**	2173	556	21,88	1297	51,07	23%	26%	24%	27%	VT 13
NRL0300HE	**01-03**	2096	556	21,88	1266	49,84	24%	26%	24%	26%	VT 13
NRL0300HE	**P2-P4**	1920	556	21,91	1265	49,80	24%	26%	24%	26%	VT 17
NRL0300HE	**P1-P3**	1843	557	21,92	1228	48,35	25%	27%	23%	25%	VT 17
NRL0330HE	**00**	1775	557	21,94	1184	46,60	25%	28%	22%	24%	VT 17
NRL0330HE	**02-04**	2183	556	21,88	1293	50,90	23%	26%	24%	27%	VT 13
NRL0330HE	**01-03**	2106	556	21,89	1262	49,68	24%	26%	24%	26%	VT 13
NRL0330HE	**P2-P4**	1930	557	21,91	1261	49,63	24%	27%	23%	26%	VT 17
NRL0330HE	**P1-P3**	1853	557	21,92	1224	48,18	25%	27%	23%	25%	VT 17
NRL0350HE	**00**	1948	557	21,93	1208	47,55	25%	28%	22%	25%	VT 17
NRL0350HE	**02-04**	2356	556	21,88	1305	51,37	23%	26%	24%	27%	VT 13
NRL0350HE	**01-03**	2279	556	21,89	1276	50,25	24%	26%	24%	26%	VT 13
NRL0350HE	**P2-P4**	2103	557	21,91	1276	50,26	24%	26%	24%	26%	VT 17
NRL0350HE	**P1-P3**	2025	557	21,92	1243	48,95	24%	27%	23%	26%	VT 17
NRL0500HA	**00**	2181	565	22,26	1236	48,65	28%	30%	20%	22%	VT 13
NRL0500HA	**02-04**	2639	563	22,15	1416	55,76	25%	27%	23%	25%	VT 10
NRL0500HA	**01-03**	2553	563	22,17	1369	53,89	26%	27%	23%	24%	VT 10
NRL0500HA	**P2-P4**	2353	564	22,22	1352	53,22	26%	28%	22%	24%	VT 13
NRL0500HA	**P1-P3**	2267	565	22,24	1296	51,02	27%	29%	21%	23%	VT 13
NRL0550HA	**00**	2219	567	22,34	1226	48,28	28%	30%	20%	21%	VT 13
NRL0550HA	**02-04**	2678	564	22,22	1406	55,35	25%	27%	23%	24%	VT 10
NRL0550HA	**01-03**	2592	565	22,24	1359	53,50	26%	28%	22%	24%	VT 10
NRL0550HA	**P2-P4**	2391	566	22,29	1341	52,81	26%	28%	22%	23%	VT 13
NRL0550HA	**P1-P3**	2305	567	22,31	1286	50,63	27%	29%	21%	22%	VT 13

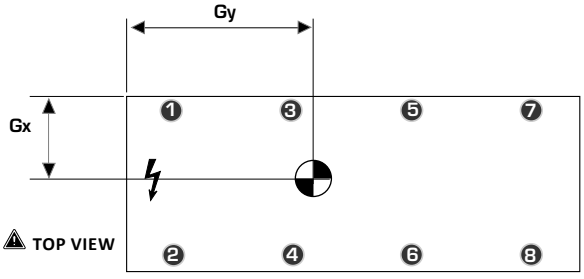
WEIGHT OF RUNNING UNITS

NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)				KIT VT
			Gxmm	Gxin	Gy	Gyin	1	2	3	4	
NRL0280HE	00	**1626**	550	**21,66**	**991**	**39,00**	**25%**	**27%**	**23%**	**25%**	VT 17
NRL0280HE	02-04	**2695**	550	**21,66**	**1243**	**48,95**	**19%**	**20%**	**29%**	**31%**	VT 13
NRL0280HE	01-03	**2618**	550	**21,66**	**1217**	**47,90**	**20%**	**21%**	**29%**	**31%**	VT 13
NRL0280HE	P2-P4	**1780**	550	**21,66**	**1091**	**42,94**	**23%**	**24%**	**26%**	**28%**	VT 17
NRL0280HE	P1-P3	**1703**	550	**21,66**	**1043**	**41,06**	**24%**	**25%**	**24%**	**26%**	VT 17
NRL0300HE	00	**1808**	548	**21,59**	**1196**	**47,08**	**26%**	**27%**	**23%**	**24%**	VT 17
NRL0300HE	02-04	**2878**	549	**21,62**	**1356**	**53,39**	**23%**	**24%**	**26%**	**28%**	VT 13
NRL0300HE	01-03	**2800**	549	**21,61**	**1334**	**52,54**	**23%**	**25%**	**25%**	**27%**	VT 13
NRL0300HE	P2-P4	**1963**	549	**21,60**	**1271**	**50,02**	**24%**	**26%**	**24%**	**26%**	VT 17
NRL0300HE	P1-P3	**1886**	549	**21,60**	**1235**	**48,61**	**25%**	**27%**	**23%**	**25%**	VT 17
NRL0330HE	00	**1823**	549	**21,60**	**1190**	**46,87**	**26%**	**28%**	**23%**	**24%**	VT 17
NRL0330HE	02-04	**2892**	549	**21,62**	**1352**	**53,23**	**23%**	**24%**	**26%**	**27%**	VT 13
NRL0330HE	01-03	**2815**	549	**21,62**	**1330**	**52,37**	**23%**	**25%**	**25%**	**27%**	VT 13
NRL0330HE	P2-P4	**1977**	549	**21,61**	**1265**	**49,80**	**24%**	**26%**	**24%**	**26%**	VT 17
NRL0330HE	P1-P3	**1900**	549	**21,60**	**1229**	**48,39**	**25%**	**27%**	**23%**	**25%**	VT 17
NRL0350HE	00	**2001**	549	**21,63**	**1212**	**47,72**	**29%**	**29%**	**21%**	**21%**	VT 17
NRL0350HE	02-04	**3070**	550	**21,64**	**1357**	**53,41**	**23%**	**24%**	**26%**	**28%**	VT 13
NRL0350HE	01-03	**2993**	550	**21,64**	**1336**	**52,61**	**23%**	**25%**	**25%**	**27%**	VT 13
NRL0350HE	P2-P4	**2155**	549	**21,63**	**1279**	**50,35**	**24%**	**26%**	**24%**	**26%**	VT 17
NRL0350HE	P1-P3	**2078**	549	**21,63**	**1247**	**49,08**	**25%**	**26%**	**24%**	**25%**	VT 17
NRL0500HA	00	**2237**	558	**21,98**	**1244**	**48,97**	**28%**	**29%**	**21%**	**21%**	VT 13
NRL0500HA	02-04	**3798**	555	**21,85**	**1572**	**61,88**	**23%**	**24%**	**26%**	**27%**	VT 10
NRL0500HA	01-03	**3712**	555	**21,85**	**1543**	**60,74**	**24%**	**24%**	**26%**	**26%**	VT 10
NRL0500HA	P2-P4	**2409**	558	**21,96**	**1357**	**53,42**	**27%**	**27%**	**23%**	**23%**	VT 13
NRL0500HA	P1-P3	**2323**	558	**21,97**	**1302**	**51,28**	**28%**	**28%**	**22%**	**22%**	VT 13
NRL0550HA	00	**2282**	560	**22,06**	**1234**	**48,59**	**29%**	**30%**	**21%**	**21%**	VT 13
NRL0550HA	02-04	**3843**	556	**21,89**	**1562**	**61,51**	**23%**	**24%**	**26%**	**27%**	VT 10
NRL0550HA	01-03	**3757**	556	**21,90**	**1533**	**60,37**	**24%**	**24%**	**26%**	**26%**	VT 10
NRL0550HA	P2-P4	**2454**	560	**22,03**	**1346**	**52,98**	**27%**	**28%**	**22%**	**23%**	VT 13
NRL0550HA	P1-P3	**2368**	560	**22,04**	**1292**	**50,87**	**28%**	**29%**	**22%**	**22%**	VT 13

WEIGHT OF EMPTY UNITS														
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)						KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	
NRL0600HA	00	2866	553	21,77	1781	70,12	4,9%	4,9%	33,4%	33,7%	11,4%	11,5%	VT 22
NRL0600HA	02-04	3351	552	21,73	1871	73,66	3,2%	3,3%	34,8%	35,1%	11,7%	11,8%	VT 22
NRL0600HA	01-03	3263	552	21,73	1854	72,99	3,6%	3,6%	34,6%	34,8%	11,7%	11,8%	VT 22
NRL0600HA	P2-P4	3086	552	21,73	1827	71,93	4,1%	4,1%	34,1%	34,4%	11,6%	11,7%	VT 22
NRL0600HA	P1-P3	2998	552	21,73	1807	71,14	4,4%	4,5%	33,8%	34,1%	11,5%	11,6%	VT 22
NRL0650HA	00	2998	535	21,06	1800	70,87	4,9%	4,6%	34,5%	32,7%	12,0%	11,3%	VT 22
NRL0650HA	02-04	3483	537	21,14	1885	74,21	3,2%	3,1%	35,8%	34,1%	12,2%	11,6%	VT 22
NRL0650HA	01-03	3373	537	21,14	1869	73,58	3,5%	3,4%	35,5%	33,8%	12,2%	11,6%	VT 22
NRL0650HA	P2-P4	3219	536	21,10	1843	72,56	4,1%	3,9%	35,1%	33,4%	12,1%	11,5%	VT 22
NRL0650HA	P1-P3	3108	536	21,10	1824	71,81	4,4%	4,2%	34,8%	33,1%	12,0%	11,4%	VT 22
NRL0700HA	00	2932	553	21,77	1759	69,25	5,2%	5,2%	33,3%	33,7%	11,3%	11,4%	VT 22
NRL0700HA	02-04	3417	552	21,73	1851	72,87	3,5%	3,5%	34,7%	35,0%	11,6%	11,7%	VT 22
NRL0700HA	01-03	3329	552	21,73	1834	72,20	3,8%	3,9%	34,5%	34,8%	11,5%	11,6%	VT 22
NRL0700HA	P2-P4	3153	553	21,77	1806	71,10	4,3%	4,4%	34,0%	34,3%	11,4%	11,5%	VT 22
NRL0700HA	P1-P3	3064	553	21,77	1786	70,31	4,7%	4,7%	33,7%	34,0%	11,3%	11,5%	VT 22

WEIGHT OF RUNNING UNITS													
NRL	TYPE	WEIGHT (lib)	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)						KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	
NRL0600HA	**00**	**2932**	**545**	21,46	**1791**	70,51	**4,8%**	**4,7%**	**34,0%**	**33,4%**	**11,6%**	**11,4%**	VT 22
NRL0600HA	**02-04**	**4541**	**547**	21,54	**2003**	78,86	**0,5%**	**0,5%**	**37,5%**	**37,0%**	**12,3%**	**12,2%**	VT 22
NRL0600HA	**01-03**	**4431**	**546**	21,50	**1993**	78,46	**0,7%**	**0,7%**	**37,3%**	**36,9%**	**12,3%**	**12,2%**	VT 22
NRL0600HA	**P2-P4**	**3175**	**545**	21,46	**1835**	72,24	**4,0%**	**3,9%**	**34,7%**	**34,1%**	**11,8%**	**11,6%**	VT 22
NRL0600HA	**P1-P3**	**3064**	**545**	21,46	**1816**	71,50	**4,4%**	**4,3%**	**34,4%**	**33,8%**	**11,7%**	**11,5%**	VT 22
NRL0650HA	**00**	**2976**	**543**	21,38	**1778**	70,00	**5,0%**	**4,8%**	**34,1%**	**33,2%**	**11,6%**	**11,3%**	VT 22
NRL0650HA	**02-04**	**4586**	**545**	21,46	**1992**	78,43	**0,6%**	**0,6%**	**37,6%**	**36,9%**	**12,3%**	**12,1%**	VT 22
NRL0650HA	**01-03**	**4475**	**545**	21,46	**1983**	78,07	**0,8%**	**0,8%**	**37,4%**	**36,7%**	**12,2%**	**12,0%**	VT 22
NRL0650HA	**P2-P4**	**3219**	**543**	21,38	**1823**	71,77	**4,1%**	**4,0%**	**34,8%**	**33,9%**	**11,7%**	**11,4%**	VT 22
NRL0650HA	**P1-P3**	**3108**	**543**	21,38	**1803**	70,98	**4,5%**	**4,4%**	**34,5%**	**33,6%**	**11,6%**	**11,3%**	VT 22
NRL0700HA	**00**	**3020**	**545**	21,46	**1769**	69,65	**5,1%**	**5,0%**	**33,9%**	**33,3%**	**11,5%**	**11,2%**	VT 22
NRL0700HA	**02-04**	**4608**	**547**	21,54	**1985**	78,15	**0,7%**	**0,7%**	**37,4%**	**37,0%**	**12,2%**	**12,0%**	VT 22
NRL0700HA	**01-03**	**4497**	**547**	21,54	**1976**	77,80	**0,9%**	**0,9%**	**37,2%**	**36,8%**	**12,2%**	**12,0%**	VT 22
NRL0700HA	**P2-P4**	**3241**	**545**	21,46	**1814**	71,42	**4,3%**	**4,2%**	**34,6%**	**34,0%**	**11,6%**	**11,4%**	VT 22
NRL0700HA	**P1-P3**	**3131**	**545**	21,46	**1795**	70,67	**4,6%**	**4,5%**	**34,3%**	**33,7%**	**11,5%**	**11,3%**	VT 22



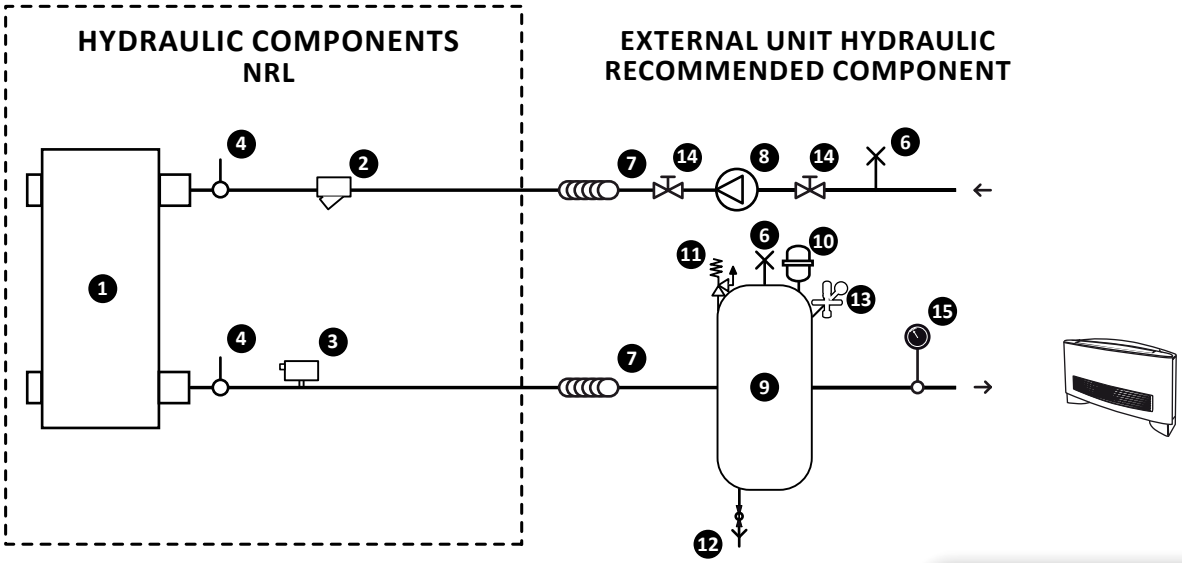


WEIGHT OF EMPTY UNITS															
NRL	TYPE	WEIGHT (lib) WEIGHT	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								KIT VT
			Gx mm	Gx in	Gy mm	Gy in	1	2	3	4	5	6	7	8	
NRL0750HA	**00**	**4541**	**749**	29,49	**2281**	**89,80**	**8,3%**	**8,2%**	**18,5%**	**18,4%**	**20,8%**	**20,8%**	**2,5%**	**2,5%**	**AVX 7001**
NRL0750HA	**02-04**	**5137**	**749**	29,49	**2294**	**90,31**	**7,5%**	**7,4%**	**20,2%**	**20,2%**	**20,1%**	**20,1%**	**2,2%**	**2,2%**	**AVX 7002**
NRL0750HA	**01-03**	**5004**	**749**	29,49	**2291**	**90,20**	**7,6%**	**7,6%**	**19,9%**	**19,8%**	**20,3%**	**20,2%**	**2,3%**	**2,3%**	**AVX 7002**
NRL0750HA	**P2-P4**	**4828**	**749**	29,49	**2288**	**90,08**	**7,9%**	**7,8%**	**19,4%**	**19,3%**	**20,5%**	**20,4%**	**2,4%**	**2,4%**	**AVX 7001**
NRL0750HA	**P1-P3**	**4696**	**749**	29,49	**2285**	**89,96**	**8,0%**	**8,0%**	**19,0%**	**18,9%**	**20,6%**	**20,6%**	**2,4%**	**2,4%**	**AVX 7001**

WEIGHT OF RUNNING UNITS															
NRL	TYPE	WEIGHT (lib) WEIGHT	CENTER OF GRAVITY				PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								KIT VT
			Gx	Gx in	Gy	Gy in	1	2	3	4	5	6	7	8	
NRL0750HA	**00**	**4630**	**742**	29,21	**2283**	**89,88**	**8,3%**	**8,2%**	**18,7%**	**18,3%**	**21,0%**	**20,6%**	**2,5%**	**2,5%**	**AVX 7001**
NRL0750HA	**02-04**	**6768**	**745**	29,33	**2317**	**91,22**	**5,9%**	**5,8%**	**23,8%**	**23,5%**	**18,9%**	**18,7%**	**1,7%**	**1,7%**	**AVX 7002**
NRL0750HA	**01-03**	**6636**	**745**	29,33	**2316**	**91,18**	**6,0%**	**5,9%**	**23,6%**	**23,2%**	**19,0%**	**18,8%**	**1,7%**	**1,7%**	**AVX 7002**
NRL0750HA	**P2-P4**	**4916**	**743**	29,25	**2290**	**90,16**	**7,9%**	**7,8%**	**19,5%**	**19,2%**	**20,7%**	**20,3%**	**2,4%**	**2,3%**	**AVX 7001**
NRL0750HA	**P1-P3**	**4784**	**743**	29,25	**2287**	**90,04**	**8,1%**	**7,9%**	**19,1%**	**18,8%**	**20,8%**	**20,4%**	**2,4%**	**2,4%**	**AVX 7001**

11. HYDRAULIC CIRCUIT

11.1. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT [NRL HA] "00" (STANDARD)



	STANDARD COMPONENT
1	Exchanger plate (SYSTEM SIDE)
2	Water filter (fitted)
3	Flow switch (fitted)
4	Water temperature probes (IN/OUT)
5	Ball stop drain
6	Air Vent

	RECOMMENDED COMPONENTS NOT SUPPLIED (CHARGED TO THE INSTALLER)
6	Air Vent
7	Anti-vibration couplings
8	Pump
9	Storage tank
10	Expansion tank
11	Safety valve
12	Ball stop Tank
13	Charging unit
14	Ball Stop
15	Manometer

PH	6-8
Electric conductivity	less than 200 mV/cm (77°F / 25°C)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
ammonia ions	none
Silicone ions	less than 30 ppm

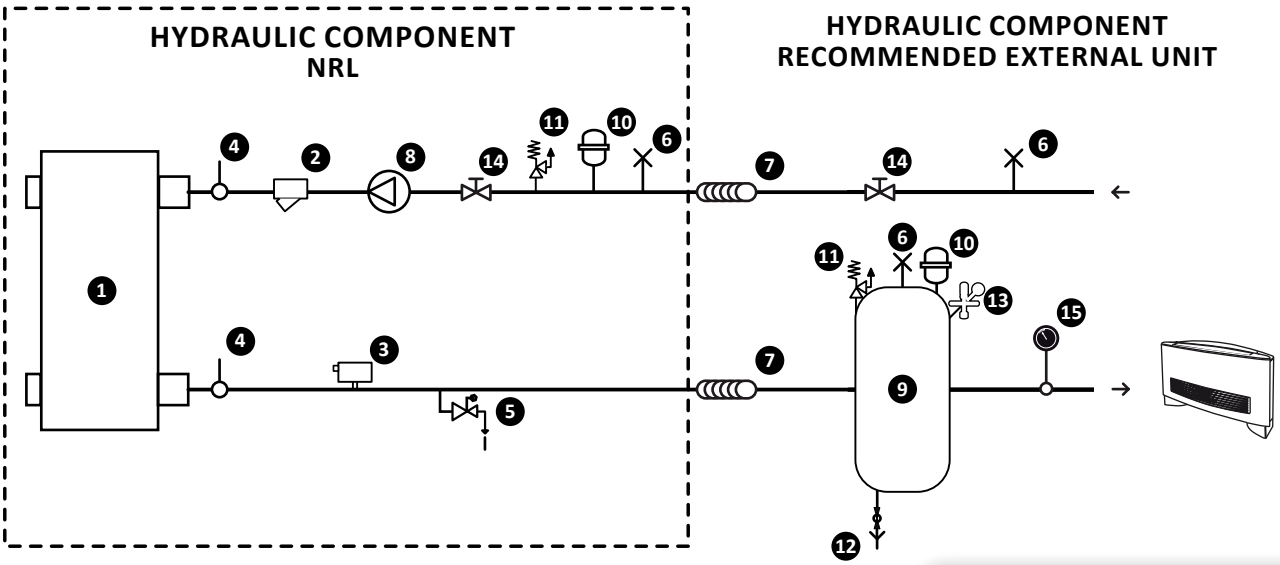
ATTENTION
The choice and the installation of components external to the NRL up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

ATTENTION
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

ATTENTION
Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit.

THE DRAWINGS ARE ONLY EXAMPLES OF THE HYDRAULIC CIRCUIT.

11.2. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT - NRL PUMP VERSION



	STANDARD COMPONENT
1.	Exchanger plate
2.	Water filter (fitted)
3.	Flow switch (fitted)
4.	Water temperature probes (IN-OUT)
5.	Ball stop drain
6.	Air Vent
8.	Pump
10.	Expansion tank
11.	Safety valve
14.	Ball Stop

	RECOMMENDED COMPONENTS NOT SUPPLIED (CHARGED TO THE INSTALLER)
6.	Air Vent
7.	Anti-vibration couplings
9.	Tank
10.	Expansion tank
12.	Ball Stop Tank
13.	Charging unit
14.	Ball Stop
15.	Manometer

PH	6-8
Electric conductivity	less than 200 mV/cm (77°F / 25°C)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
ammonia ions	none
Silicone ions	less than 30 ppm

ATTENTION
The choice and the installation of components external to the NRL up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

ATTENTION
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

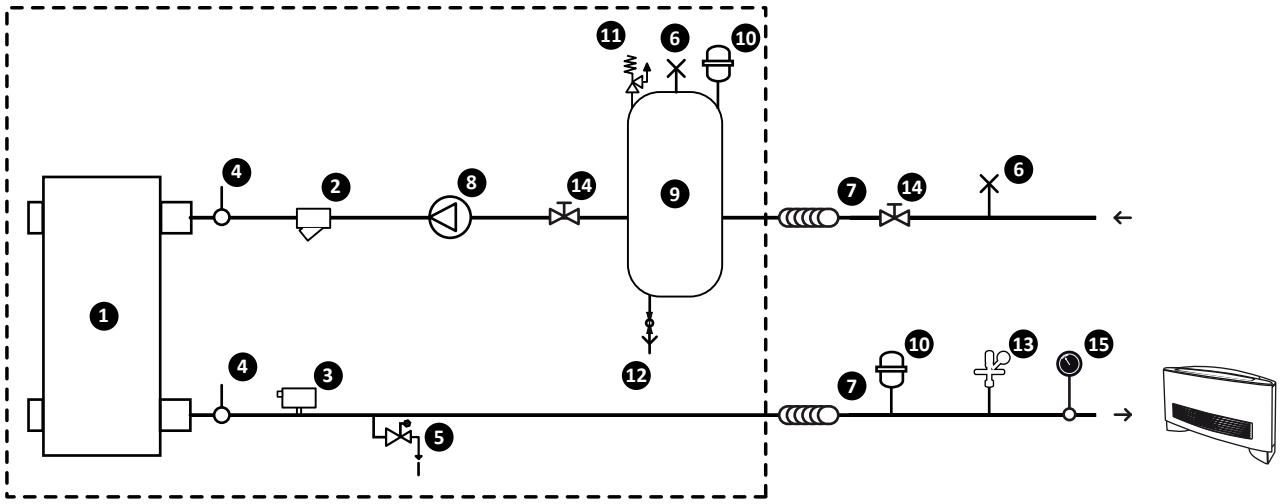
ATTENTION
Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit.

THE DRAWINGS ARE ONLY EXAMPLES OF THE HYDRAULIC CIRCUIT.

11.3. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT - NRL PUMP VERSION AND STORAGE TANK

HYDRAULIC COMPONENT
NRL

HYDRAULIC COMPONENT
RECOMMENDED EXTERNAL UNIT



	STANDARD COMPONENT
1.	Exchanger plate
2.	Water filter (fitted)
3.	Flow switch (fitted)
4.	Water temperature probes (IN-OUT)
5.	Ball stop drain
6.	Air Vent
8.	Pump
9.	Tank
10.	Expansion tank
11.	Safety valve
12.	Ball stop Tank
14.	Ball Stop

	RECOMMENDED COMPONENTS NOT SUPPLIED (CHARGED TO THE INSTALLER)
6.	Air Vent
7.	Anti-vibration couplings
10.	Expansion tank
13.	Charging unit
14.	Ball Stop
15.	Manometer

PH	6-8
Electric conductivity	less than 200 mV/cm (77°F / 25°C)
Chloride ions	less than 50 ppm
Sulphuric acid ions	less than 50 ppm
Total iron	less than 0.3 ppm
Alkalinity M	less than 50 ppm
Total hardness	less than 50 ppm
Sulphur ions	none
ammonia ions	none
Silicone ions	less than 30 ppm

ATTENTION
The choice and the installation of components external to the NRL up to the installer, who must operate according to the rules of good technical design and in compliance with the regulations in force in the country of destination.

ATTENTION
The hydraulic pipes connecting to the machine must be properly sized to the actual flow of water required by the system in operation. The water flow to the exchanger must always be constant.

ATTENTION
Carefully wash the plant, before connecting the unit. This allows cleaning to remove any residue such as weld spatter, slag, rust or other impurities from the pipes. These substances may otherwise accumulate in and cause a machine malfunction. The connecting pipes should be supported so as not to weigh, with their weight on the unit.

THE DRAWINGS ARE ONLY EXAMPLES OF THE HYDRAULIC CIRCUIT.

12. ELECTRONIC CONTROL(PCO[5])

START-UP CIRCULATING PUMP

1. Turn the unit on (ON)
2. Start Pump
3. Control water flow rate (20 seconds):
   Flow switch or pressure switch (if provided)
4. Whenever alarms do not occur, the compressor starts.

ANTI-FREEZE ALARM

Reference parameters:

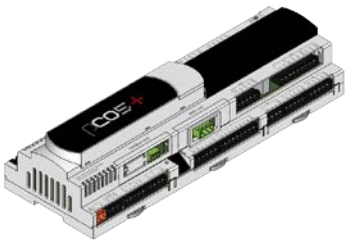
Compressor		**BLOCK - OFF**	**ON**
Temperature		3°C <	> 3°C
Max operations		n° 2	-
Cod. Anti-freeze alarm		**See User Manual**	
Restart	Manual		
Electical Heater		**OFF**	**ON**
Temperature		> 5°C	4°C <
Circulating Pump		**OFF**	**ON**
Temperature		> 5°C	4°C <
Only for pure water (not added with glycol)			

WATER FLOW ALARM

If the water flow rate is not sufficient, this safety stops the compressors and the pump

Water Pump	**BLOCCO - OFF**	**ON**
	Flow Switch or Pressure Switch (if provided)	
Water flow rate is not sufficient	>20 seconds	-
	Compressor not work	
Cod. Alarm	**See User Manual**	-

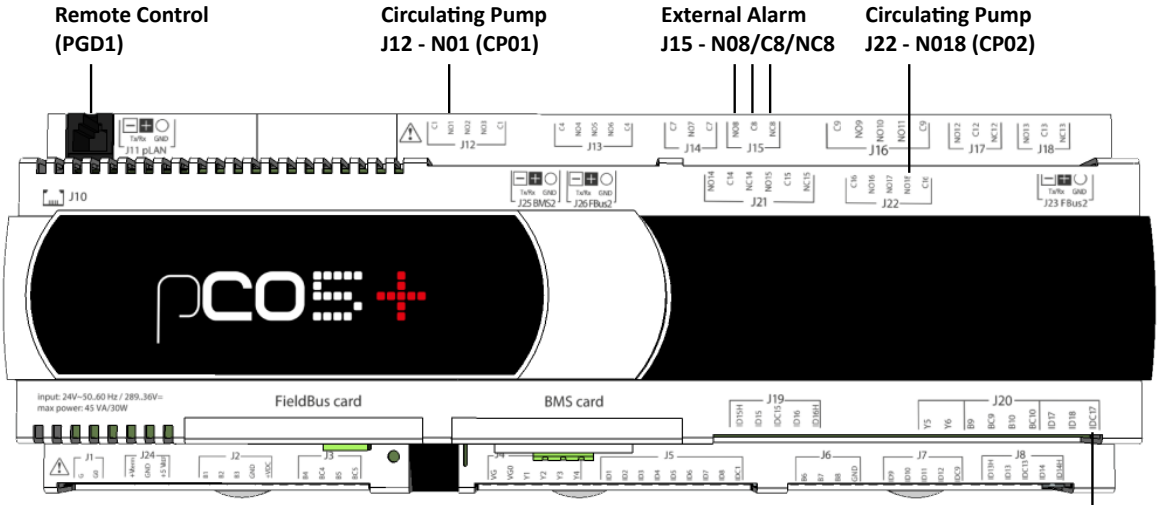
Water flow rate is sufficient	-	>20 seconds
		Start Compressor

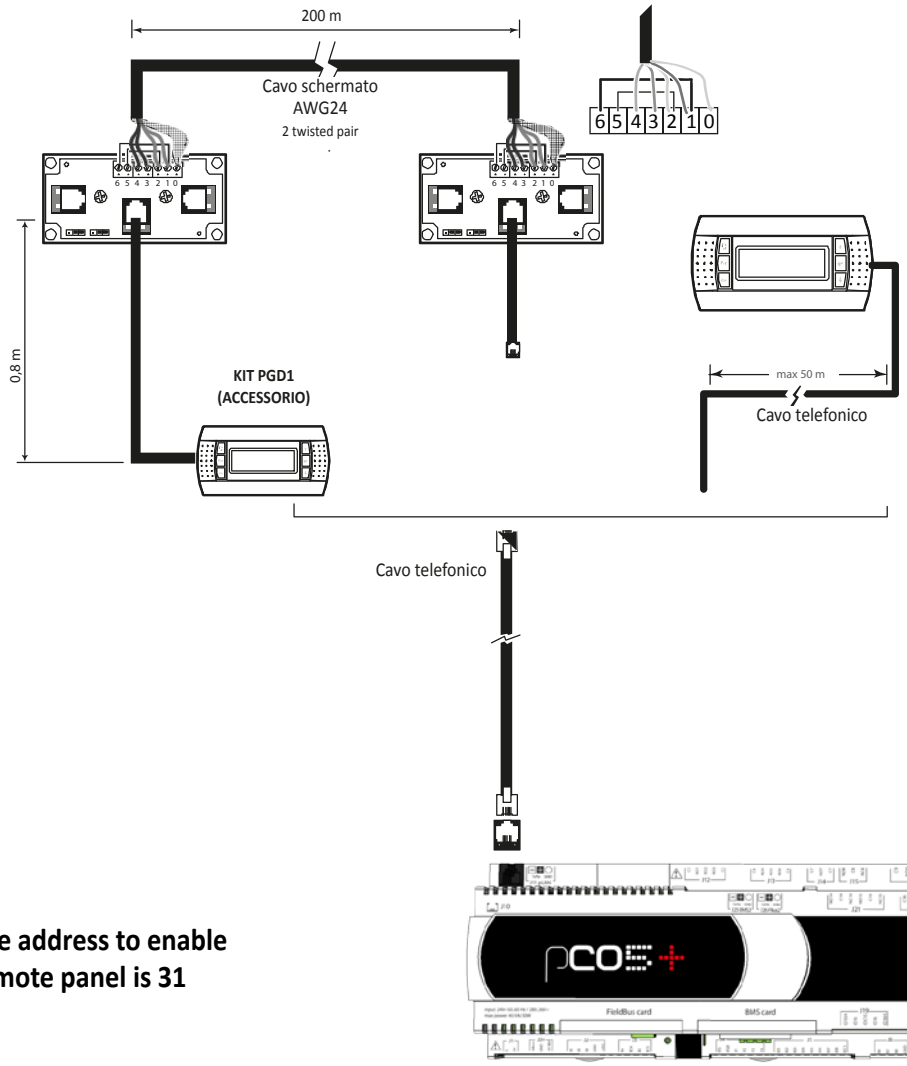


Versions with Total Recovery and Condensing Units are equipped with GR3 electronics (standard remote panel)

All the other versions have pCO5 electronics (remote panel available as accessory)

AUXILIARY CONNECTIONS
(For Standard Version)





- **The address to enable remote panel is 31**

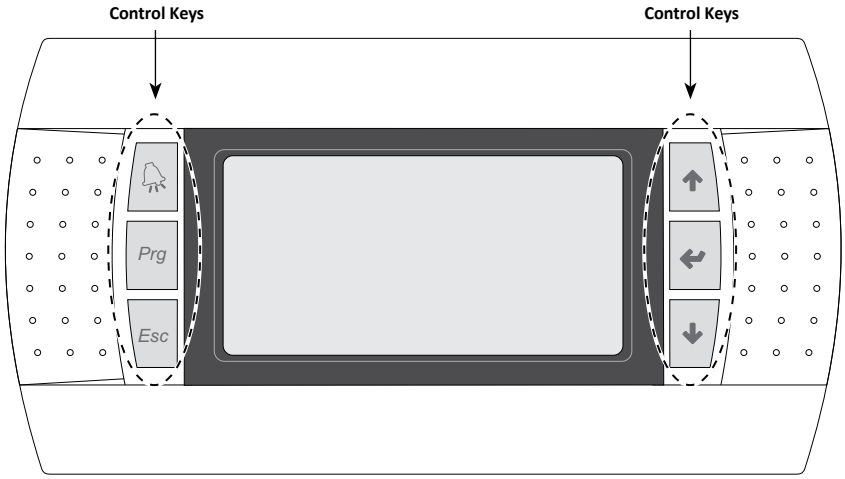
For more information, refer to the wiring diagrams in the selection program or site www.aermec.com

13. USER INTERFACE (PGD1)

The unit control panel allow the quick setting and display of the unit's operating parameters. The board memorises all the default settings and any modifications. By installing the remote control panel PGD1 it is possible to remotely replicate all the functions and the settings available on the unit. After a power failure the unit is capable of an automatic restart, retaining the original settings.

The user interface consists of a graphic display with six navigation keys; the display is arranged through a menu hierarchy, activated by pressing the navigation keys. The default display of these menus is the main screen. The navigation between the various parameters is by using the arrow keys located to the right of the display. These keys are also used for the modification of the selected parameter.

INTERFACE CONTROL KEYS

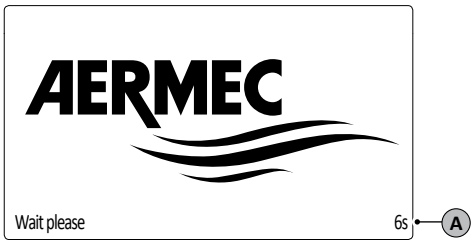
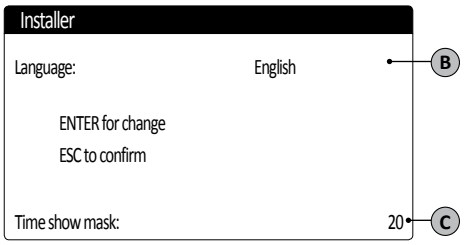


Key	Fucntion
	ALARM key Displays the list of active and historical alarms (red LED on = active alarm)
	MENU ACTIVATION key • Pressing this key activates the navigation between menus (orange LED on = winter operating mode active)
	EXIT MENU key • Pressing this key returns to the previous menu
	NAVIGATION (+) key • Pressing this key when navigating between menu/parameters passes to the next menu/parameter • Pressing this key when modifying a parameter increases the value of the selected parameter
	NAVIGATION (enter) key • Pressing this key when navigating between menus allows entry to the selected menu • Pressing this key when navigating between parameters allows selection of the parameter displayed to modify it • Pressing the key when modifying a parameter confirms the modification of the parameter value selected
	NAVIGATION (-) key • Pressing this key when navigating between menu/parameters passes to the previous menu/parameter • Pressing this key when modifying a parameter decreases the value of the selected parameter

14. START-UP PROCEDURE

After having powered up the unit the control board will carry out preliminary operations before being ready for use. This initial procedure takes around 60 seconds to complete. During the initial loading procedure two screens are displayed: a start-up screen and a screen to select the system language. These screens are detailed in the table below.

WARNING: The system language can be set on the screen displayed at the start-up or can be modified at any time through the appropriate screen contained in the Installer menu.

Display on the unit	Index	Display/Parameter
	A	**Remaining time for software loading:** this value shows the remaining time to starting the software loaded on the unit, and passing the to system language selection
	B	**System language:** this parameter shows the current language set for the system. To change the language follow the instructions shown on the screen.
	C	**Remaining time to select the language:** this value shows the remaining time to modify the language. When the time elapses the display goes to the main screen (Main screen - General monitoring). **WARNING: It is possible to modify the system language at any time using the appropriate screen contained in the Installer menu. (Menu password = 0000).**
WARNING: It is possible to modify the system language at any time using the appropriate screen contained in the Installer menu. (Menu password = 0000).		

15. MENU STRUCTURE AND NAVIGATION

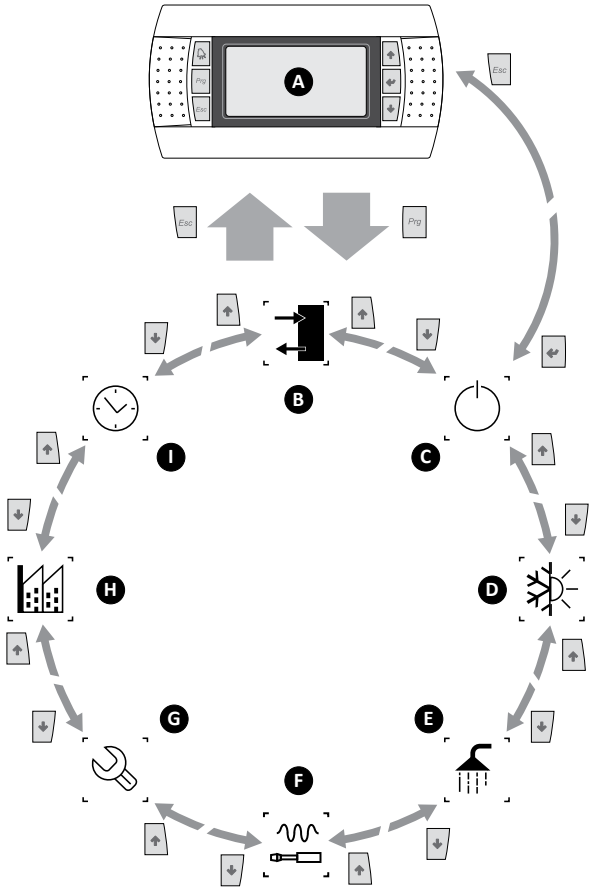
Both the functions to control the unit and the operating information are displayed on the unit mounted control panel. All the functions and information are arranged in screens which in turn are grouped into menus.

During the normal operation of the unit the main screen is displayed, from which it is possible to access the selection of the other operating menus.

The menus are displayed through the rotation of the icons that they represent. Once the desired icon is selected the chosen menu is entered, permitting the display or modification of the parameters that it is made up from. The procedure for navigating the menus, or changing parameters, is explained in detail in the chapter "User operating procedures".

The adjacent drawing shows the relation between the various menus and the navigation keys used.

The operating menus are arranged as in the following drawing:



⚠ **WARNING: Improper selection of the parameters in the Installer menu may cause malfunctions of the unit. It is recommended that these parameters are only modified by personnel qualified in the installation and configuration of the unit.**

Index	Icon	Menu	Menu function
A	---	MAIN	The screens in this menu display the current conditions of the unit (unit status, setpoints,circuit data, etc.)
B		IN/OUT	This menu contains advanced information on the unit operation
C		ON/OFF	This menu permits the unit to be enabled or disabled, and provides information on the status
D		SYSTEM	This menu permits the selection of the operating modes, the water setpoints and the time-clock for the system
E		RECOVERY	If the unit includes heat recovery, this menu permits the setting of the parameters associated with the heat recovery
F		INSTALLER	This menu contains the settings useful for the installer (enabling digital inputs, BMS configuration, control, pumps, etc.) **WARNING: This menu is password protected. The password is: 0000**
G		ASSISTANCE	This menu is only accessible to qualified personnel
H		FACTORY	This menu is only accessible to qualified personnel
I		CLOCK	This menu contains the clock settings for the system control (date, hour, calender)

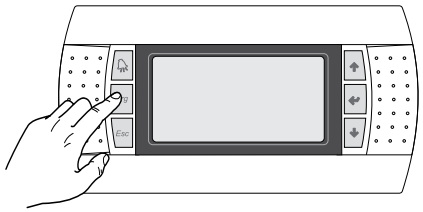
16. USER OPERATING PROCEDURES

To check or modify the operating parameters of the unit it is necessary to use the interface of the control panel on the unit. The basic operations that the user must be capable of, for the correct use of the unit, are:
(1) Moving from one menu to the next.
(2) Selecting and modifying a parameter.

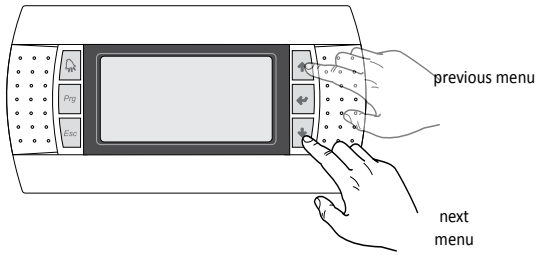
1

Moving between menus

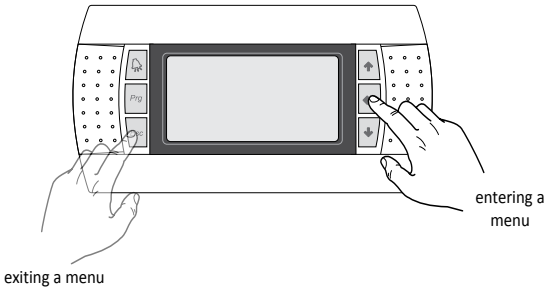
(a) To move between the menus, the order in which they are displayed is shown in the previous page, enter the menu selection mode by pressing the key (Prg).



(b) Once in the menu selection mode it is possible to move between menus using the arrow keys: the key (↑) to move to the previous menu, and the key (↓) to move to the next menu.



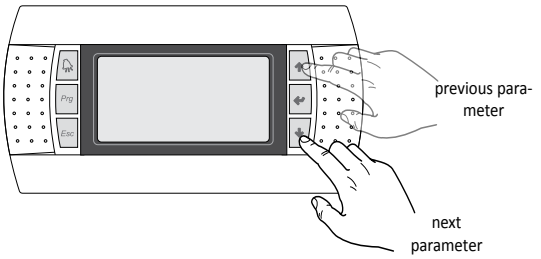
(c) When the desired menu is seen press the key (↵)to enter the menu. Press the key(Esc) to return to the menu selection mode.



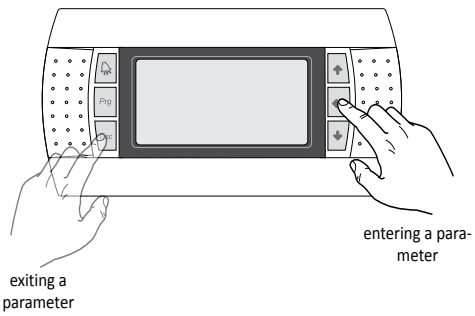
2

Selecting and modifying a menu

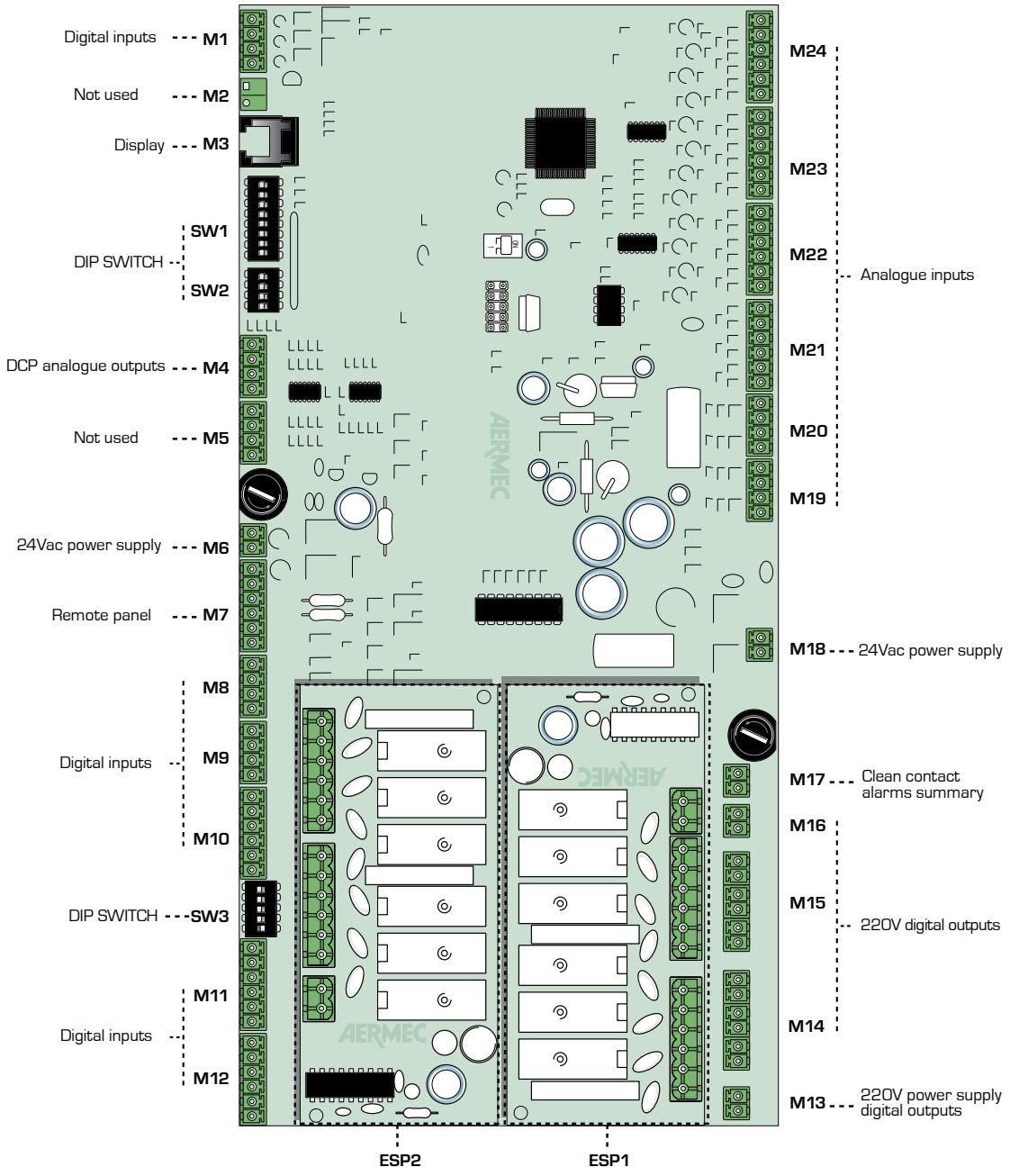
(a) Once in the menu selected, by following the procedure (1), it is possible to move between the screens using the arrow keys: the key (↑) to move to the previous parameter, and the key (↓) to move to the next parameter.

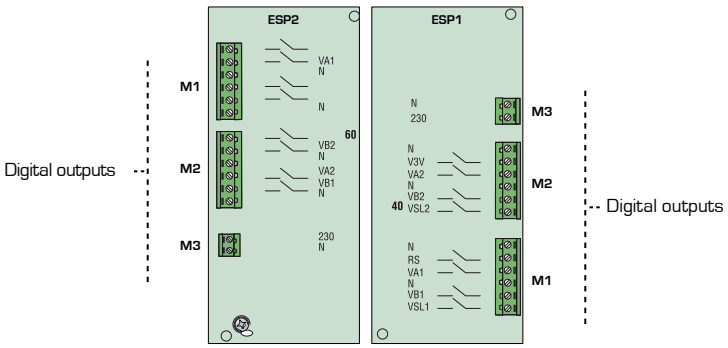


(c) When the desired parameter is seen press the key (↵) to enter the parameter. To exit the parameter and return to the parameter selection mode press the key (Esc).
WARNING: Once a parameter is selected by pressing the key (↵), the parameter selection mode is automatically accessed and in this mode the desired parameter values can be set with the following procedure:
(1) Pressing the key (↵) causes a flashing cursor to appear on the first modifiable field of the parameter. If no modifiable fields are displayed then the cursor will not appear.
(2) Pressing the key (↑) or the key (↓), the value of the field can be increased or decreased.
(3) Pressing the key (↵) confirms the modification of the field value, saving it in memory. On the basis of the type of parameter selected the number of modifiable fields can change.



18. ELECTRONIC CONTROL(GR3)





Versions with Total Recovery and Condensing Units are equipped with GR3 electronics (standard remote panel)

All the other versions have pCO^5 electronics (remote panel available as accessory)

CONNECTION TO THE POWER SUPPLY

Accertarsi che non ci sia presenza di tensione sulla linea elettrica a cui vi allaccerete.

TO ACCESS THE ELECTRIC BOX

Turn ¼ the screws of the electrical panel in counter-clockwise direction

Turn the handle of the door-block disconnecting switch to OFF (see figure).

In this way, the electrical panel can be accessed

ELECTRICAL POWER CONNECTION

For functional connection of the unit take the supply power cable to the electrical panel inside the unit in the previous page and connect it to the disconnecting switch terminals observing the phase, and the earth.

AUXILIARY CONNECTIONS AT THE USER/INSTALLER EXPENSE

The terminals indicated in future explanations are part of the GR 3 control boards. For installation requirements, refer to the wiring diagram supplied with the unit.
The wiring diagram together with the manuals must be kept in good conditions and readily accessib le for future operations on the unit .

AUXILIARY SWITCH (IAD)

To prepare the auxiliary switch, connect the device to the clamp 4 of the control board M7 SC and to the clamp 4 of the remote panel.

PUMP CONTACTOR (CP01 - CP02)

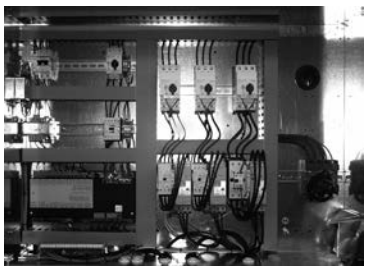
To prepare the pump contactor, connect the device CP01 to the clamp 2 of the control board M16 SC and the device CP02 to the clamp 4 and 6 of the control board M1 SE2.

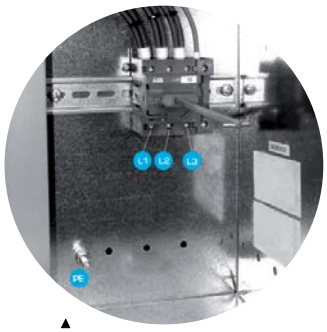
EXTERNAL ALARM (EA)

To prepare an external alarm device, connect the device contact to the clamp 1 and 2 of the control board M17.

CONNECTION PR3 (STANDARD)
Connect the remote panel PR3 to the control board M7 SC (as shown below),
remember that the maximum allowed distance is 50 m.

THE PR3 CONNECTED MUST BE ENABLED, AS WELL.
See next procedure.





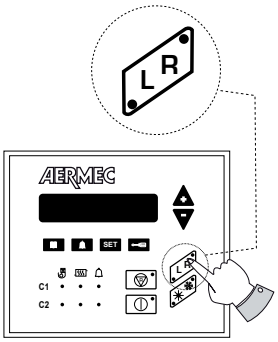
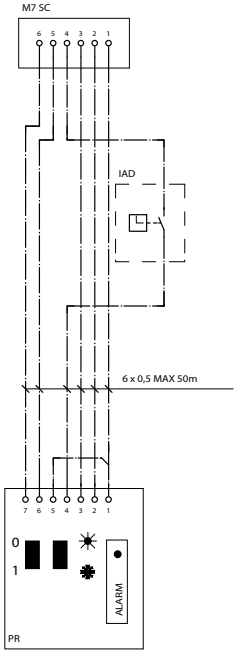


Fig. 1

Key fig.1	
L1	Line 1
L2	Line 2
L3	Line 3
PE	Earth

CONNECTION
REMOTE PANEL - PR3

COMANDO A DISTANZA
REMOTE CONTROL



ENABLING
REMOTE PANEL - PR3
To enable the remote panel PR3:
- act on the L/R key on the small panel of the GR3 on the machine (as shown in the figure above)
- when the LED next to the letter R (Remote) lights up, the machine function will be enabled by the remote panel.

SEASON CHANGEOVER

- For each seasonal change check that the operation conditions return to the limit.
- Check that the absorption current of the compressor is less than the maximum indicated in the technical data table.
- Check in the models with three-phase supply power that the noise level of the compressor is not abnormal, in this case invert a phase.
- Make sure that the voltage value are within the prefixed limits and that the displacements between the three phases (three-phase supply power) do not get above 3%.

SEASON CHANGE OF THE PANEL ON THE MACHINE

To activate the season change, just press the indicated key in (fig. 5). To ensure that the operation is successful,
machine must be active as remote or local.
For further information refer to the USE manual.

SEASON CHANGE OF PR3

Just act directly on the switch. The machine turns off automatically and it restarts with the selected operation mode.

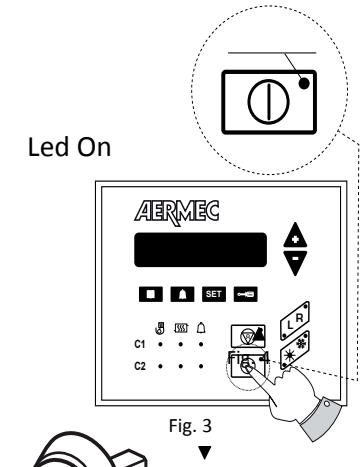
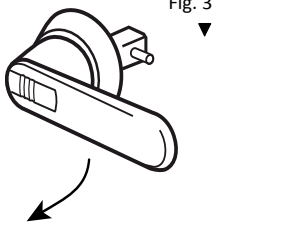


Fig. 3



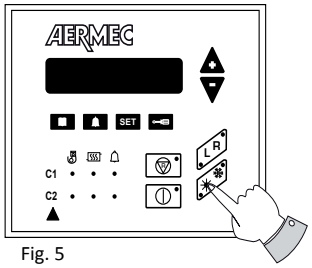
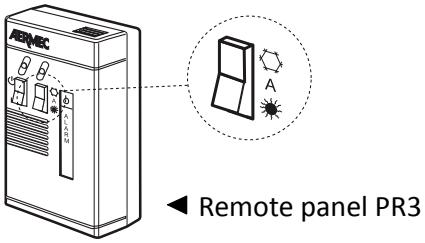


Fig. 5



◄ Remote panel PR3

⚠ATTENTION

1)Commissioning must be performed with standard settings. Only when the inspection has been completed can the functioning Set Point values by changed.
Before start-up, power the unit for at least 12-24 hours, positioning the protection magnet circuit breaker switch and the door lock isolating switch at ON.
Make sure that the control panel is off in order to allow the compressor oil sump to heat.

2) We recommend to envision a machine book (not supplied, but the user's responsibility), which allows to keep track of the interventions performed on the unit.
In this way it will be easy to suitably organise the interventions making research and the prevention of any
machine breakdowns easier. Use the date to record date, type of intervention made (routine maintenance, inspection or repairs), description of the intervention,
measures actuated.

3)It is forbidden to LOAD the cooling circuit with a refrigerant different to that indicated. Using a different refrigerant gas can cause serious damage to the unit.

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